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CROP EXPERIMENTS,

BOMBAY PRESIDENCY,

1894-95.

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No. A.—3730 of 1895.

FROM

E. C. OZANNE, ESQUIRE, I. C. S., M.R.A.C.,
Survey Commissioner, and Director,
Land Records and Agriculture,
Bombay;

To

J. MONTEATH, ESQUIRE, I. C. S.,
Acting Chief Secretary to Government,
Revenue Department, Bombay.

Poona, 9th December 1895.

SIR,

I have the honour to forward the Analysis of Crop Experiments, made in 1894-95, at a date still later than that on which the report was ready last year. Mr. Mollison has done all in his power to complete the Analysis early enough to ensure the receipt of the compilation by officers at the opening of the fair season, but has not succeeded.

2. The table given below exhibits the extent of work done :—

Division.	1892-93.		1893-94.		1894-95.	
	Reported.	Rejected.	Reported.	Rejected.	Reported.	Rejected.
Northern Division	54	...	44	1	37	3
Central Division	35	5	45	20	56	12
Southern Division	32	2	45	2	41	3
Total ...	121	7	134	23	134	18

Of the gross number of experiments made, 21 were performed by Survey officers, 4 by Superintendents, Land Records and Agriculture, and 3 by the Superintendent of Farms. There is again no report from the Superintendent, Land Records and Agriculture, S. D., who alleges severe pressure of settlement duties. It is expedient that Mr. Lushington should not again fail in this duty, which is one peculiarly important, I think, for officers in his position who more than officers of the regular Revenue line should improve their knowledge of agriculture.

3. In preparation for the quinquennial return of yield statistics all experiments are "ordinary", *i. e.*, no attempt is made to study the general profits of agriculture by including in the scope of an experiment all the crops of an individual holding.

4. For some years, chiefly with reference again to the quinquennial return, an effort has been made to indicate the crops on which tests should be made in each district.

A statement is appended, which shows what crops were actually tested, and which of them will find entry in the quinquennial return, the latter being marked with an asterisk :—

Division.	*Jowári.	*Bájri.	*Rice.	*Wheat.	*Harik.	*Nágli.	Navani.	Vari & Barag.	*Gram.	Val.	Láng.	Onions.	*Sugarcane.	*Sesamum.	*Linseed.	*Rapeseed.	Nigerseed.	*Groundnut.	*Cotton	Grasses.	Total
Northern Division	2	2	1	3	..	5	.	..	11	1	1	..	2	1	..	1	..	..	1	7	37
Central Division ..	2	12	6	11	..	4	..	..	10	..	..	3	1	4	2	.	..	1	..	..	56
Southern Division	8	4	10	1	1	6	1	2	5	1	..	..	..	..	..	..	2	..	..	..	41
Total .	11	18	17	15	1	15	1	2	26	2	1	3	3	5	2	1	2	1	1	7	134

Northern Division.

5. There is still a falling off in the total number of experiments made in this Division in spite of a considerable contribution by Survey officers. From Surat only one report has been received for reasons partly shown by Mr. Mollison. The orders of Government in the Resolution on the last report naturally could not affect the season of which the work is now under review, but there are at present two officers, practically on special duty, and their work is being supplemented by special attention by Survey officers, and by the Superintendent of Farms. The results will be included in next year's review, unless it is found advisable to make a special report in view of the question of Surat revision settlements.

6. In the Gujarát districts the season was unfavourable, especially for *bájri*, cotton and sesamum, on which tests are reported. Experimenters found much difficulty in finding suitable subjects for experiment, and a rather unusual number of tests were taken on late crops following kharif crops of the same year.

These were useful in showing how far the *rayat* can recoup himself for the partial failure of the main crop. Some tests were taken on crops sown too late for good results. Taking season into consideration none of the experiments indicate over-assessment, or even uneven rental in *revised* areas.

7. In Thána, where conditions are very diverse from those of other districts in this Division, there is evidence also of the success with which second crops make up largely for an unfavourable early crop. In this district the early rices were much damaged, but even here second crops did very well, though distinctly unusual; for as a rule land, on which the early poor kinds of rice are grown, retains no moisture for a later crop.

8. Mr. Hudson's grass tests are valuable and bear out the correctness of the action taken at revision settlement in this and the Kolába Collectorate in raising the rental where grass finds an easy market. Mr. Mollison gives in extenso the receipts at grass auctions, but does not comment on the apparent anomalies thereby shown. It may be added, therefore, that where the sale-proceeds are low, as compared with the assessment, the land is either too far from the rail, or is a poor grass producer on account of the presence of tree growth. These tracts are under revision and in them one of the faults of original settlement will be corrected by which in *varkas* and *rabi* the maximum rate did not vary with market facilities. The table and the actual tests taken also show that where these facilities are great, much *kharif* or rice land is found to pay better for grass than for tillage. Much of the area shown in the tables is probably unoccupied waste.

9. Messrs. Cadell and Phirozsháh are complimented on the care with which their reports have been made, but in the Division the general standard of excellence this year is certainly not high. Mr. Mollison has rejected three tests reported for adequate reasons. It is a question whether all Mr. Kábráji's experiments should not have been summarily rejected for his neglect to cut the crop of the minimum area fixed. The same treatment might well have been accorded to Mr. Pránlál. Mr. Mollison has shown some reasons for doubting his accuracy. There is another, that the yield in two of three tests should have been found at precisely the same figure. The officers in Broach succeeded in carrying out the fixed programme in its entirety.

Central Division.

10. In the total of reported experiments there is a satisfactory increase. The number of rejected reports, though not so large as last year, is still too large. In each case the reason for rejection is recorded and seems sufficient. Indeed, as in the Northern Division so in the Central, some reports have been admitted which hardly deserved acceptance.

11. In the following table both classes are included:—

Name of officer.	District.	Experiments.	
		Rejected.	Untrustworthy.
Mr. Sitárám Dámodar	Kháudesh ...	2	...
„ C. M. Thatte	Násik	1	...
„ G. H. Hampton	Do.	3	1
„ S. Padamji	Ahmadnagar ...	3	...
„ V. B. Vádekar	Do. ...	0	3
„ A. Westropp	Poona	1	...
„ R. C. Brown	Sholápur ...	1	...
„ B. Kennedy	Do. ...	1	...

The untrustworthy experiments were those taken on areas below the fixed minimum. The minimum is low enough.

12. In Ahmadnagar and Sholápur the number of tests taken was very low. In Poona the programme was fully carried out.

13. A considerable number of experiments were made on *pátasthal* land in Khándesh and Násik, where the question of the manner in which the charge for water of running streams should be made in future will soon come up at revision survey. In one of these tests (No. 44) the incidence is high, but that could not have been otherwise, when it is seen that the occupant tried to get a crop of wheat without manure, under a bad rotation, in land usually irrigated.

In another (No. 57) the incidence is very high, even though calculated only on the value of the second crop. The land is invariably double-cropped, and the assessment is not proved excessive by the failure, not fully explained, of a meagrely watered late crop of gram. In the same district a very similarly circumstanced gram crop succeeded remarkably well (Exp. No. 60), though the water charge was much lower.

Test Nos. 62, 65 and 66 were on the rice crop in a rotation, which includes sugarcane once in four years, on land irrigated by *pát*. In these the results were very good, though the occupant in test No. 65 lost by growing *kamod* rice from broadcast sowing.

14. In Sátára one test on *pátasthal* land (No. 88) is reported. The average assessment should have been shown in column 10 of the summary as Rs. 8-3-9, and the incidence in column 11 as 26·60. The conditions are somewhat anomalous. On the Khánápur settlement, orders were passed fixing a limitation to the increase of the total *pátasthal* assessment over that recorded at original settlement. In the Khánápur and Koregaon tálukas an adjustment was necessary. The proposed assessment had gone beyond the limit, and under the alternative methods sanctioned by Government for reducing the total to the limit, in some cases, as in the case of the land of Experiment No. 88, the *area* to be assessed was fictitiously reduced. The whole area is nevertheless *pátasthal*, with all the rights of *pátasthal*, and the amount of the water cess must be considered as the water charge for the whole of the area, classed as *pátasthal*.

In no other case does any comment seem called for as regards incidence of assessment.

15. Mr. Mollison's remark (Exp. No. 74) as to the "moderate rainfall" of the Mával táluka of Poona is hardly correct.

His onion tests, taken to give himself the best information as to the success of the substitution of onions for potatoes, where the "ring" disease is prevalent, are valuable. The high farming shown by the detail of cost of cultivation, the correctness of the rotation and the skill in utilization of *pát* water are worthy of special notice.

16. In this Division Messrs. Du Boulay, Seddon, Ichhárám and Cursetji performed specially careful experiments.

SOUTHERN DIVISION.

17. The number of tests made is slightly below last year in spite of a considerable contribution from Survey officers in Kolába. Three were rejected, but only one of these for non-observance of standing orders. The other rejections were due to the inutility of testing a small row crop only in a mixture. There are other experiments which Mr. Mollison has admitted, because they have an interest, which strictly should have been rejected. It is no excuse to say that the mistake in taking too small an area was due to having no copy of standing orders, first because no experimenter should take experiments without this guide before him, and because also the report form also contains the rule as to the minimum area of test.

18. In the Southern Marátha districts the smallness of the incidence of assessment throughout is very remarkable. Nos. 96, 97 and 111 are perhaps exceptions. No. 96 appears to be one of those wonderful fields which without manure grow continuous *jowári*. They are often talked of, and it is interesting to find proof that they do exist. In this year the success of the crop was not great, but the yield figures, if they were available, would be interesting to contrast for a long period of years with the Rothamsted continuous wheat experiments. The crop of No. 97 suffered from cloudy weather, but the incidence is not excessive. That in No. 111 was a fallow crop and unfortunate even as such.

19. The extraordinary range of yield in *jowári* is well brought out. The range is from 126 lbs. (No. 96) to 1,486 lbs. (No. 99) in adjoining tálukas. These are both yields of good land, not very differently assessed. In the latter the high yield is due chiefly to good rotation and manuring. In the former the occupant, as has been shown, trusts to the natural fertility of his land. The net profit in the two fields no doubt was less diverse.

In light lands the yields were in most cases very satisfactory, *e. g.*, Nos. 94 and 95.

20. In the Konkan districts the results of the special trials in Devgad have already been reported, but Mr. Mollison has placed them on the record for publication. They give no support to the allegation of over-assessment in that táluka. The Survey officers have done useful work in the Kolába tálukas yet for revision. In them the assessment is not low, though a very fair profit is disclosed. The contrast between Nos. 123 and 124 exhibits clearly the fact, well known, but better thus clearly shown, that in the rábed seed-bed the yield is much higher than in the unmanured field transplanted with rábed seedlings.

21. The tests on hot weather rice, following a rain crop, Nos. 133 and 134, do not show results to be compared with similar tests previously published. In these as in the case of other second crops, *e. g.*, Nos. 115 and 116, the incidence takes no count of the chief crop of the season, but the second crops paid very well generally.

22. In this Division the work done by Messrs. Kelkar, Deshpánde and McNeill was good and careful.

I have the honour to be,

Sir,

Your most obedient Servant,

E. C. OZANNE,

Survey Commissioner, and
Director, Land Records and Agriculture.

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ANALYSIS OF CROP EXPERIMENTS.

NORTHERN DIVISION.

Ahmadabad.

The programme settled for this district embraced tests on wheat, *juvár*, *bájri*, gram and sugarcane. Six tests only on gram have been reported. Mr. Robertson, Assistant Collector, conducted no experiments owing to his absence with a survey party.

Mr. J. K. N. Kábráji, Assistant Collector,

Submits three crop tests on gram. The selected crops were in each case uneven. Count was taken of this in selecting the test areas, but the area of crop experimented upon in each field was below the prescribed dry-crop minimum. The reasons assigned are not satisfactory. As the crops were uneven, there was the greater necessity to strictly follow the standing orders.

The first test (No. 1) was taken on new rice land. The soil is *goráddu* and the field is embanked. It bears an assessment of Rs. 4-10-8 per acre, and grows rice every year followed by gram as a second crop in years of favourable late rainfall. The second crop is not often taken. This year the rice, which was manured with about 17 cart-loads ordinary manure per acre, was a poor crop. Gram occupied the whole number, but part of the field was sown late, and the crop on this portion was not ripe at date of experiment and was not so promising as the portion experimented upon. When the rice was harvested, that portion of the field tested was ploughed and again cross-ploughed. The seed was broadcasted at the second ploughing by hand in the furrow behind the plough and covered by the next furrow. The reported seed-rate, 55 lbs. per acre, is probably about average for this method of sowing, though more than the formulæ. The crop was sown in November, but did not ripen until the 7th April, an indication that the soil held enough moisture.

The crop was tested on two separate areas, but the outturns did not materially differ. The average of both works out 1,287 lbs. pulse per acre, which at a cheap rate is worth Rs. 23-8-6. The experimenter does not value the by-product. He says the leaves and the husks of the legumes are fed to cattle, but never sold. The crop is assessed at the maximum anna valuation. The incidence of assessment, 19·83 per cent, is not high for a second crop, but it may not fairly represent the burden of assessment on the whole number, because half the field grew a crop admittedly inferior to the crop tested.

This officer's second and third tests (Nos. 2 and 3) were taken on gram crops, which were each second crops after rice. The fields were close together; the tests were taken on the same day. The crops were selected as average of the village, yet the yield of one field is much higher than that of the other. The higher assessed field yielded the poorest crop. Apparently the experimenter selected the fields to afford "some striking considerations as to the inequality of the assessment." It is impossible to judge, from the information reported, whether the fields tested are unequally assessed or not. If the experimenter wished to prove that they were, he ought to have made a much fuller enquiry than he did. The higher assessed field was not cropped in the previous year, "owing to want of a cultivator." The lower assessed field for six years previous to the present season grew no second crop. In respect of the higher assessed field no information is given as to the frequency of second crops in previous years. The experimenter remarks that this year the rainfall for this crop was "perhaps excessive than otherwise" which I take to mean that this field either by position or otherwise is more retentive of moisture than the other field, the crop of which was apparently not affected by the same cause. If, taking one season with another, one rice field retains more moisture for a

second crop than another rice field, I can understand that the former should bear the higher assessment, even though in occasional years excess of moisture may do harm.

Two test areas were selected in the higher assessed field ; three in the other. The outturn results from each test area show that the crop over each field was very irregular. The lower assessed field was large (9 acres 4 gunthas). The test areas were, respectively, 2 gunthas, 2 gunthas and 1 guntha, or in the aggregate $\frac{5}{4}$ of the prescribed minimum. They, respectively, yielded at the rate of 1,315, 955 and 395 weight *sers* (40 *tolas* each) of pulse per acre. The higher assessed field was smaller (3 acres 1 guntha) and 2 test areas of 2 gunthas each, $\frac{1}{2}$ the prescribed minimum, were selected. The outturns from each were, respectively, 705 and 500 weight *sers* per acre. I doubt very much whether in either field the gross outturn could be approximately gauged by the results from such small test areas even if these were selected by an experienced farmer, and it is certainly unsafe to judge of the relative assessments of the fields from tests on the second crops only.

I tabulate results from each field as under :—

	Anna Estimate.	Outturn of Pulse per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 2) ...	14	1,012	20 9 0	3 15 4	19·25
Second do. (Exp. No. 3) ...	11	618	12 0 9	5 9 11	46·64

The kharif crops in each field are assisted by canal irrigation, Rs. 7 per acre being the water-rate. Neither field was manured for the rice or the gram. Each field was well ploughed for the second crop. The crops were sown about the same time and were ready for harvest on the same day. The outturn on the lower assessed field is unusually high, and might be fairly estimated at the maximum standard. The market rate at which the principal product is valued is in each case unusually low.

Mr. Jethálál Varajbhái, District Deputy Collector,

Sends three crop tests (Nos. 4—6) on gram. The fields selected for experiment have each black soil and ordinarily grow cotton and *juvár*. *Juvár* had been sown in each field, but the crops partially failed through excessive rainfall. The experimenter gives few details except his tabulated figures. The season was favourable. The cultivation is described as good in the first and third tests, indifferent in the second. The seed-rate is reported the same for each field, and I think under-estimated at 20½ lbs. per acre. The crops were sown seasonably in October and ripened about the 20th of February. The burden of assessment can scarcely be judged of from the results, which are in the first and third tests as good as could reasonably be expected from land which usually does not grow second crops. The principal product is in each case valued at the cheap rate of 41 lbs. per rupee.

I tabulate results below :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 4) ...	12	506	230	13 9 6	3 11 4	27·28
Second do. (Exp. No. 5) ...	12	260	76	6 13 7	4 8 2	65·85
Third do. (Exp. No. 6) ...	12	439	124	11 7 2	4 3 6	36·85

Kaira.

Four experiments on *bajri* and two on wheat have been reported from this district. Of these, two tests on *bájri* have been omitted for reasons given further down.

Mr. E. H. E. Leggatt, Assistant Collector,

Submits an experiment on *bájri* taken on garden land assessed at Rs. 12-12-5 per acre. This experiment I must reject. This crop was spoiled by heavy rain and the outturn is estimated at 6 annas only. *Bajri* cannot be called a representative crop of garden land. It is grown on such land generally with the object of resting the soil for a season from irrigation and to provide fodder for the large number of work cattle necessary for well irrigation. The results from a *bájri* crop grown on garden land can form no guide as to the burden of assessment even in the most favourable year. The experiment was begun by Mr. Lord. He proceeded on leave. The crop when dry was threshed and weighed by Mr. Modi and the report has been tabulated by Mr. Leggatt from notes left by his two predecessors. This is an unsatisfactory way of submitting a crop experiment report.

This officer submits two tests (Nos. 7 and 8) on wheat. One taken on embanked land, the other on ordinary *jirayat*. The former gave much the best results, the reason being that the crop of this field was very much better looked after and the cultivation of very much better character than that in the other. In each case wheat was a second crop after rice and the fields are generally double cropped with the same crops every year. In 1894-95 the rice of the first field was fairly manured, that in the other field was only lightly manured. No manure was given for the second crop. This system of cropping is distinctly exhaustive and shows no appreciation of the value of good rotation.

The crops were each sown in October, the seed being sown by hand, through a seed tube fixed behind the plough at the last ploughing. This method of sowing, unless the soil is very smooth, requires a large seed-rate, and that reported in the first test, 77 lbs. per acre, is probably much nearer the mark than that reported for the second, 24 lbs. per acre. The incidence of assessment is in each case light for second crops.

The results are as under :—

	Anna Estimate	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 7) .	12	642	538	24 1 0	2 7 3	10·19
Second do. (Exp. No. 8) .	8	241	308	9 11 0	1 10 5	17·04

Mr. B. E. Modi, District Deputy Collector,

Sends three tests on *bájri*. In each case subordinate pulses grew with the cereal. The pulses were not tested, but the experimenter's estimates indicate that their yield was poor. The probable outturn of subordinate crops cannot, however, be approximately estimated by a cursory inspection. The season was unfavourable for *bájri* throughout Gujarát. The crops tested were damaged by heavy rain falling during the flowering period. *Bájri* is peculiarly susceptible of injury at this critical time. I think the anna estimates are pitched far too high and particularly so in the second test where the incidence of assessment works out 72·61 per cent. The field is small, 34 gunthas. The assessment exigible from the field is Rs. 4. The registered owner has rented it to a Koli who

pays for the field Rs. 10-8. Mr. Modi thinks this a high rent and that the Koli is able to pay it because there are mango and other trees which the Koli tenant has grown. If the tenant's income is chiefly from the trees the field should not have been selected for experiment; because if the trees are so numerous as to be the chief source of income the cultivated area must be unfavourably affected by their shade and otherwise. There are hedgerow trees round almost every number in *goráḍu* soil in the Kaira district. A wide headland of grass is left under the trees and the cultivated crops are not therefore damaged to any appreciable extent, and a border of grass is not itself unprofitable. The *bájri* outturn is valued at approximately ⅔ of the rent paid by the Koli. It is certain that the results are much under average and therefore no guide as to the burden of assessment. For this reason I cannot report the experiment.

As regards the other experiments the incidence of assessment works out no higher than might reasonably be expected in an year which was admittedly unfavourable.

In the first field (Exp. No. 9) *bájri* had subordinate crops of *mug*, *math* and *juvar*. The soil is *goráḍu* and grows *bájri*, *kodra* and *bávto* in consecutive years, the two former with subordinate mixtures; the latter as usual alone. The *bájri* was not manured this year, but a liberal application was given in each of the two previous years. The *bájri* would apparently have given a good yield of grain, if it had not been damaged by heavy rain. I judge of this by the weight of straw. The by-product is valued at a high rate, *viz.* 192 lbs. per rupee or Rs. 10 per acre.

The crop of the third test (No. 10) was manured with 16 carts of farmyard manure per acre. Excessive rain spoiled this crop also, yet the experimenter estimates the outturn at the average standard. The field grew *bávto* in each of the three preceding years. The cultivation of the *bájri* is described as very good. The crop was twice sown, the first seedlings being eaten up by catterpillars. The second sowing was late in July and therefore decidedly unseasonable for Gujarát. The *bájri* had a subordinate sprinkling of *juvar*, which did not succeed. It is reported that the field has occasionally been irrigated for cold weather crops; that the water was found brackish and that the soil was somewhat injured thereby.

I tabulate the results from each field as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
		Principal Product.	By-product.				
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 9)	14	364	1,923	21 1 6	3 14 1	18·39	By-product valued at Rs. 10 per acre
Third do. (Exp. No. 10)	16	585	1,595	23 7 0	4 8 3	19·26	By-product valued at Rs. 5-10-0 per acre.

Panch Mahaʼls.

Mr. Heblikar was directed to conduct 3 tests on rapeseed and 2 on gram, Mr. Pránlál 3 each on *bávto* and sugarcane. The former conducted only 1 test on rapeseed and 2 on gram, exigencies of tour and *jamábandi* work having prevented him from doing further work. The latter carried out only the *bavto* tests.

Mr. B. R. Heblikar, District Deputy Collector,

Reports two tests on gram and a third on rapeseed. Each was a second crop after maize. In the three fields selected for experiment the kharif crop is generally maize, and second crops are taken annually. The second crops are either gram, wheat or rapeseed, the first named being most commonly grown. Maize and gram in the same year is not a bad combination, but wheat or rapeseed taken after maize must be considered an exhaustive system of cropping.

Those lands in the Panch Mahâls which have in recent times been brought under cultivation may stand the strain temporarily or even for some time, but sooner or later exhaustion will be made manifest if the cultivators do not show some appreciation of the value of good rotation. The experiments go to prove that the burden of assessment for the time being is extremely light.

Rapeseed (Exp. No. 11) was the subject of the first test. The previous maize crop was manured with 10 loads of ordinary manure per acre, but none was applied directly for the rapeseed. The soil is *goráḍu* assessed at Rs. 2 per acre. The season was favourable, the cultivation indifferent. Thirteen pounds of seed per acre drilled in November through a single seed tube fixed behind a plough produced a 12-anna crop which ripened early in March and yielded 359 lbs. seed per acre. The principal product is valued at Rs. 17-8-0 per acre. The percentage incidence of assessment is 11·22 and this for a 12-anna second crop indicates that the burden of assessment is very light.

The gram tests (Nos. 12 and 13) may be conveniently contrasted. The previous maize crops were each manured, in one field with 16 cart-loads of ordinary manure per acre, in the other with 6 carts. The gram was not directly manured in either field, but the pulse after the more liberally manured maize yielded best. Each field has *goráḍu* soil; one field is assessed at Re. 1-13-9 per acre, the other at Re. 1-4-9. Season and tillage are described in each case as good. There is a slight difference in seed-rate but both are about average. Each crop was sown seasonably in November and ripened in the third week of March.

The results are as under:—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
		Principal Product.	By-product.				
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 12.)	16	1,313	1,313	22 10 8	1 13 9	8·20	Previous crop liberally manured.
Second field (Exp. No. 13.)	12	846	615	14 6 0	1 4 9	9·02	Previous crop sparingly manured.

Mr. Pránlál Harkisandás, District Deputy Collector.

This officer sends three *bávto* tests. All three were taken on the same day. Two of the fields selected were in one village, the third in another. It is possible, but not probable, that the three numbers were close together. The test areas in the aggregate measured 33 gunthas. Four patches of 2 gunthas each were cut in the first field. The whole crop was cut in the second field, the area being small. In the third field 5 patches of 2 gunthas each were cut. I question whether an experimenter could accomplish this in one day and give the close personal supervision required by standing orders. For this reason I do not attach much value to the experiments.

In the first and third fields (Exp. Nos. 14 and 16) *bávto* had *math* subordinate to it. The experimenter attempts to apportion the areas respectively under the cereal and pulse, but as the *bávto* was grown from transplanted seedlings which were first grown in a seed-bed and the *math* was broadcasted, I do not see how the respective areas can be apportioned. The subordinate pulse was not tested in either field and the acre averages of the *bávto* are calculated on the supposition that it alone occupied the whole area. Of course the incidence of assessment as deduced from this data appears higher than it actually is. Experiments of this class are, therefore, worthless for gauging the burden of assessment.

This officer's second test (No. 15) was taken on red brown land assessed at Re. 1-10-8 per acre. *Bávto* is grown every year, the reason probably being that the field is suitable for *bávto* by position. The crop was transplanted but neither

seed-bed nor field was manured. Under the circumstances the outturn was as good as the cultivator could reasonably have expected. A 5⅓-guntha seed-bed sown with approximately 11 lbs. seed provided seedlings for an acre of transplantation. The seed-rate is high. Late rains damaged the crop to some extent.

The results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 14 ...	12	651	2,906	15 3 0	1 11 10	11·45
Do. No. 15 ...	12	651	2,651	15 1 2	1 10 8	11·06
Do. No. 16 ...	10	691	2,640	15 14 6	0 11 7	4·56

Broach.

The programme for this district was fully carried out, one experiment each on rice, sesamum, *láng*, *juvár*, cotton and wheat has been reported.

Mr. Phirozshah Pestanji, District Deputy Collector,

Submits one rice test. The report is carefully and intelligently compiled and details of considerable value are given.

In the Broach district the season is reported to have been disastrously unfavourable for staple dry-crops, owing to excessive unseasonable rain. On the other hand, it was exceptionally favourable for rice. Two principal varieties of rice are grown in this officer's charge—one fine, the other coarse. The coarse variety, known locally as *Jádu sáliu* was selected for experiment. The cultivation of this variety is in favour with the poorer cultivators because in an average season it need be irrigated only two or three times, whereas the finer rice wants water twice as often. Weeding too need not be so carefully or so often done as with finer varieties, and the latter take a month longer to ripen.

The field selected is rent-free service Inám land. It is rented by a Bohora from the village Bhangi for a term of five years at approximately Rs. 16-10 per acre, the Government assessment being Rs. 10. The Bohora occupies other land and is well-to-do. The field is under the village tank. It grows rice every year, but apparently no second crop. The crop was grown from transplanted seedlings. The seed-bed was well manured; but no manure was applied to the field. A 3⅓-guntha seed-bed is reported to have supplied seedlings for an acre of transplantation. I cannot accept the estimated seed-rate, 100 lbs. per acre, as accurate. It is much too high. The cultivation is described as indifferent, weeding being neglected and the banks for impounding the water had been in part washed away. The occupant explained that *Jádu sáliu* was hardy enough to thrive in spite of these disadvantages. Ordinarily the crop would have been watered twice or thrice from the tank; this year the rainfall was unusually heavy and only one watering at the beginning of October was necessary. The reported weight of straw is less than that of grain. This is unusual. The experimenter notes the fact, and says he is quite sure of his figures.

The outturn, &c., results are as under:—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 17 ...	18	2,769	1,900	52 8 5	10 0 0	19·03

I think it is pretty clear that the profit which accrued to the cultivator was quite satisfactory after paying rent and meeting all expenses. The cost of tillage was certainly lighter considerably than usual, because no manure was applied and weeding was neglected.

Mr. W. S. Dracup, District Deputy Collector,

Submits one test each on *láng*, rabi *juvár* and wheat. These are the principal dry-crops excepting cotton of the black soil of Broach. The season for wheat is described as fair. For *juvár* and *láng* it was decidedly unfavourable. The heavy October rains left the fields in such a swampy condition that sowing of these two latter crops was unseasonably delayed. Both *láng* and *juvár* in Broach are sown usually before the commencement of the usual rabi season. *Láng* was damaged by cloudy weather in January, caterpillars appearing at the same time. Apparently the *láng* field selected was much above average, because the experimenter reports it was one of the few *láng* crops that yielded any grain produce at all. It was damaged by caterpillars but not to the same extent as *láng* in other fields.

In the tested field (Exp. No. 18) cotton is grown in alternate years with either *juvár*, *láng* or wheat. The soil is deep black and bears an assessment of Rs. 5-3-8 per acre. Forty-one pounds of seed drilled in November (usual season of sowing is September) produced an 11-anna crop which ripened in the middle of February. No manure was applied this year. The outturn, 768 lbs. of pulse per acre with the by-product, is valued at Rs. 22-3-5. The by-product is, however, valued at an exceedingly high rate, about 106 lbs. per rupee or approximately at Rs. 10 per acre. The incidence works out 23·54 per cent and would be considerably higher if the by-product was valued at a fair rate. Cotton will, however, in an average year bear the greater portion of the Government assessment if the field is not wet by position. There are a good many low-lying wet fields in Broach, and although cotton is occasionally successfully grown on such land, *láng* must be considered the principal and the rent-paying crop.

The *juvár* crop (Exp. No. 19) was sown in October, a month later than usual. The field was lightly manured. Cotton and *juvár* are generally grown in alternate years; occasionally *láng* and wheat are taken. The assessment is Rs. 4-10-6 per acre. The seed-rate, about 9 lbs. per acre, is nearly average. Tillage is described as good. The outturn, 468 lbs. of grain and 1,570 lbs. of by-product, is according to local opinion held to be a 14-anna crop. This valuation is probably much too high. Otherwise the burden of assessment is very heavy. The percentage incidence works out 27·76.

The wheat results (Exp. No. 20) are more satisfactory. Probably the season would have been more accurately described as good than as fair. The seed, 43 lbs. per acre, was seasonably drilled in November. The heavy late rains must have left the soil full of moisture, and, no doubt, the wheat benefited thereby. The assessment of the field, Rs. 3-11-4 per acre, is less than in the two other fields. No manure was applied. The cultivation otherwise was good. The soil is deep black and grows cotton in alternate years with either wheat or *juvár*. The outturn of 742 lbs. of grain and 790 lbs. of straw is valued at Rs. 24-13-6 per acre, and is, I think, over-estimated as a 19-anna crop. The incidence of assessment, 14·95 per cent, is moderate for Broach.

Mr. Sorábsháh Hormasji, District Deputy Collector,

Conducted two ordinary experiments, one on cotton, the other on sesamum. The season for both crops was unfavourable throughout the Broach district. The sowing of cotton was unseasonably delayed owing to heavy early rains. Late sown cotton rarely succeeds. The crop was considerably damaged by rain in November and by excessive cold during three consecutive nights in January. Many of the immature bolls fell to the ground owing to the effect of cold. Sesamum requires no more moisture than a deep moisture-holding soil retains from favourable September-October rains. The crop is certain to be damaged if very heavy rain falls after it is sown. The October-November rainfall had apparently this effect throughout Broach.

The results of this officer's cotton experiment (No. 21) exemplify the difficulties met with in accurately testing this crop. Four pickings were made at intervals between the middle of March and the 1st of May. No district officer, except under exceptional circumstances, could spare the time to personally supervise each picking, and he would further find considerable difficulty in having the field watched between pickings to prevent pilfering or surreptitious picking.

Mr. Sorábsháh supervised the first picking which was the most important one. The other pickings were attended to by the Mámlatdár.

A portion of the first picking was hand-ginned to determine the percentage of lint which was found to be 28·15 per cent. The proportion of clean cotton to seed is reported to be usually about 33 per cent, and an exceptionally good crop will give 35 or 36 per cent. The inference is that the season unfavourably affected the crop and caused a lower percentage of lint than usual.

The field under experiment was not manured this year. It appears to have been fairly tilled however. The outturn is, I think, estimated correctly at half the maximum. The price throughout the cotton season varied from Rs. 69 to Rs. 76 per *bhár* of 24 maunds of 40 *sers* of 38½ *tolas*.

The results are as under :—

	Anna Estimate.	Outturn of Seed Cotton per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 21 ...	10	227	17 6 9	5 12 3	33·09

This officer's sesamum test (No. 22) was taken on a black soil field assessed at Rs. 3-8 per acre. Cotton and sesamum are grown in alternate years. The field was unmanured this year, but lightly manured by folding sheep in the previous year. The seed was drilled in August, the seed-rate being 1 lb. per acre, which is about average. The crop ripened at the end of January. It was damaged to a considerable extent by late rains. The outturn is much overestimated at 12 annas.

The yield, 153 lbs. oil-seed per acre, is valued at Rs. 11-5-8. The by-product was not valued. It is only useful as fuel. The incidence works out 30·82 per cent. This is high. Sesamum is a precarious crop. It is, however, a good preparation for cotton which is undoubtedly the rent-paying dry-crop in Broach. In the year when sesamum is grown there is a good opportunity for thoroughly working and cleaning the land, the sesamum being sown generally late, and the cotton of the following season undoubtedly benefits.

Surat.

Only one test on sugarcane by Mr. Cadell has been reported from this district. Mr. Kotvál was prevented through illness from completing the rice tests begun by him. Mr. Wood attempted some tests in *bájri*, but found the results unsatisfactory and did not report them. Later on, owing partly to ill-health and partly to heavy work, he did not conduct any experiments. Mr. D'Souza's omission to do any experiments has been unexplained.

Mr. P. R. Cadell, Assistant Collector,

Submits a sugarcane test. The report is full, excepting that it is not clear whether the anna estimate is based on a 12 or 16-anna average standard. A reference to the Collector has failed to clear the point, because Mr. Cadell, when he gave over charge, left nothing on record to show what standard was adopted.

The field experimented upon is partly *jiráyat*, partly *kiári*. The embanked portion grows rice during four consecutive years, then sugarcane is taken. It may be that two years' assessment is chargeable against the sugarcane, because this crop

is planted in December. It is, of course, possible that rice may have been grown in the same year, in which case the time between the harvesting of the rice in October and the planting of the sugarcane in December would be almost too short for manuring the field and for the careful preparatory tillage which sugarcane necessarily needs. The *kiári* portion of the field bears an assessment of Rs. 13-8-8 per acre. The land is irrigable from a well situated in an adjoining field. The occupant paid at the rate of Rs. 8-5-0 per acre irrigated, for the right of drawing water from this well. The variety of cane grown was *Vánsi*. It is a hard thin variety. The chief advantage of this variety is that it is hardy and does not require much water. The crop was harvested 13 months after plantation and was irrigated meantime only 14 times. A soft cane in the Poona district would be watered more than twice as often in the same period.

It is reported that *Vánsi* does not give such good results as *Malbári* cane. The latter is a soft tall variety extensively cultivated in the Surat Collectorate, but it is reported that the soil of Jalálpur táluka, in which the test was taken, does not suit this sort. It needs much more water than *Vánsi*. The field under test was fairly manured, 20 cart-loads per acre of ordinary manure (which was all bought) being applied. More ordinary manure would have been applied, but it could not be got. The field was top-dressed with castor cake, Rs. 16⅔ worth per acre. It is said that the castor cake was applied at the roots of the canes to save them from excessive damp. I do not see how the cake could possibly exercise this effect. Its effect manurially would, of course, be valuable. In Gujarát it has the reputed effect of keeping white ants from attacking and destroying sugarcane. The field was prepared for ploughing in the ordinary way. The sets, 16,661 per acre, were trampled into the mud in the furrows of the previously flooded beds.

The experimenter values the *gul* at about 20½ lbs. per rupee, and the dry stripped leaves at the high rate of Rs. 25 per acre. The green tops were as usual fed to the work bullocks working the cane-mill. The refuse crushed cane was not alone sufficient as fuel for boiling the juice. It was supplemented by *tur* stalks. A three-roller mill was used to express the juice. Six pairs of bullocks in relays of 2 pairs at a time were used to work it.

The outturn results per acre are as under:—

		Lbs.
Weight of canes	... ...	52,976
Weight of juice	... ...	29,341
Weight of *gul*	... ...	4,945
		Percentage.
Percentage of juice to cane	...	55·39
Do. of *gul* to juice ...	...	16·85
Do. of *gul* to cane ...	...	9·33

Thána.

Experiments were directed to be made in sesamum, *rági*, gram and sugarcane. No tests could be taken on the first, because its harvest was completed before the commencement of the touring season. Three experiments each on gram and *rági* have been received. Mr. Hudson could not do the sugarcane test owing to press of other work.

Messrs. Hearn and Hudson of the Konkan Revenue Survey carried out some experiments in this district; the former one each on sugarcane and lucerne, the latter 6 on grass.

Mr. L. G. Deshmukh, Assistant Collector,

Reports two *nágli* tests. One of the fields experimented upon was rather an unfortunate selection. It is reported that "just above this field there is a place for the deposit of the manure heaps of the village, and in the rainy season water flows from it into the land by which it profits considerably". This is not an average condition, and under standing orders experiments should only be taken on average crops.

Each crop was grown on *varkas* land. The field of the first test (No. 24) is assessed at Re. 0-2-11. It apparently grows two *nágli* crops in succession after one year's fallow, but it is not likely that the practice of taking two crops in three years could be maintained on this land for any length of time. Longer periods of fallows or liberal manuring must necessarily be resorted to. The field was not manured this year. The crop was grown from seedlings raised as usual on a rábed seed-bed. The experimenter instituted special enquiries as to seed-rate and proportionate area of seed-bed to acre of transplantation. He reports that the former is about 8 lbs. per acre and the latter as 1 to 4. The season was good on the whole. The October cyclonic rain delayed harvest, but did not damage *nágli* to the same extent as rice. In this test as well as in the other the experimenter neglects the by-product. The grain, 581 lbs. per acre, is estimated as an average outturn and valued at Rs. 13-2-0 per acre. The incidence is only 1·31 per cent.

The second test (No. 25) was taken on the field which lies under the village manure heaps, and it is quite possible that, as reported, the field only lies fallow one year in four. *Nágli* is followed by *vari* and *udid* during the short rotation. The assessment is Re. 0-3-4 per acre. No manure was used except in rabing the seed-bed. Tillage was good and season as in the previous test. The crop yielded 890 lbs. of grain per acre, worth Rs. 19-6-0. This outturn was locally estimated at the maximum standard. The percentage incidence is only 1·07.

Mr. C. W. M. Hudson, Assistant Collector,

Submits a test on gram and another on *vál*. Both crops yielded well, the gram especially so. I think the *vál* is under-estimated at 11 annas. Both were second crops on rice fields. The experimenter refers to the beneficial effect which each crop exercises in smothering weeds also to the ameliorating influence on the soil of all pulse crops. Undoubtedly *vál* or gram, if grown as second crops in rice fields, act as all good rotation crops do. Each crop, if it succeeds, is a good preparation for the rice crop of the following season.

The gram (Exp. No. 26) was locally estimated as an 18-anna crop. It might fairly bear the maximum valuation. The late rainfall, though disastrous for unreaped ripe rice, was, of course, beneficial for the gram. The field was ploughed when dry enough after the rice was removed and the gram was broadcasted early in December immediately before the second or cross-ploughing. The second ploughing, no doubt, effectively covered the seed, but the seed was evidently sown on a rough unpulverized surface, and this partially accounts for the unusually high seed-rate of 118 lbs. per acre. Gram was a second crop after rice in each of the last three years. The field is reported to be more retentive of moisture than most rice fields. The crop took over three months to ripen—an indication that it was not hastened to maturity by want of moisture. The assessment is only Rs. 1-8-11 per acre. The gram yielded 957 lbs. of pulse which irrespective of the by-product (the value of which was neglected by experimenter) is valued at Rs. 33-7-0 per acre. The incidence works out 4·65 per cent. This is an exceedingly satisfactory figure if the interest of the cultivator only is considered.

The *vál* crop (Exp. No. 27), experimented upon by this officer, also yielded well. The season was not altogether favourable, because the heavy rain which fell after the seed was sown interfered, to some extent, with even germination. The survey number has 5 *pot* numbers. There appears to be little variation in the soil as the *pot* numbers bear a pretty equal acre assessment. The field is classed as *kharif* soil. Rice is grown every year and second crops in seasons of favourable late rainfall. Second crops were grown in two of the last three years. This year about 5 per cent of the whole survey number grew no second crop. About 5 per cent grew a second crop of *san* hemp, whilst the remainder was under *vál*. The *vál* was broadcasted at a rather high seed rate, 75 lbs. per acre, in the middle of November. The cultivation of the crop is described as indifferent, but in what respects is not reported. The crop ripened at the end of March and yielded 760 lbs. pulse per acre, which with the by-products is valued at Rs. 16-4-0. The assessment is Rs. 3-13-4 per acre and the incidence works out 23·59 per cent: a result which is quite satisfactory for a second crop in a rice field.

Mr. V. R. Patvardhan, District Deputy Collector,

Submits one *nágli* and two gram tests. I cannot enter the results of the former in the tabulated statement. The test was taken on good level *varkas* land. The outturn results are exceptionally good, but the experiment is of no value in showing the incidence of assessment, and for this reason is rejected. The crop was raised on a patch of ground liberally rábed with cowdung, branch-wood, &c., as a seed-bed for rice, and the *nágli* seedlings were planted in this area after the rice seedlings were removed. The whole number measures nearly 19 acres, and it is impossible that the whole area could have been treated in the liberal manner described, and the results are much above average.

One of the gram crops tested by this officer was grown as the sole crop of the year in uneven *rabi* land which grows the same crop every year. The other crop was a second crop in a rice field, second crops of gram or *vál* being grown only in years when sufficient moisture remains in the soil after the rice is reaped.

The *rabi* field was properly ploughed and seasonably sown. If the land was in good tilth when the seed was sown, as it probably was, there is no reason why less seed should not have sufficed. In both fields the seed-rate is reported as 74 lbs. per acre. I can understand it being so high in the second field, which was not properly ploughed and necessarily must have been in a rough unpulverized condition. The seed was in each field broadcasted and ploughed in. Each field was sown in the third week of November and the crops ripened in the second week of March. Both tests were taken on the same day and in the same village. The season was favourable. The *rabi* field yielded well, the crop being classed as an average one. The rice field yielded poorly, the crop being locally estimated at 8 annas. Necessarily the incidence of assessment in the latter test looks high, but if the value of the rice crop be considered the burden of assessment need not be considered heavy, and is probably as light as it is in the *rabi* field. The cost of cultivating gram after rice would be much less than that of gram in a *rabi* field on account of the frequent ploughings necessarily required for the latter.

The results of the two tests are as under, by-products being neglected in both cases :—

	Anna Estimate.	Outturn of Pulse per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
	As.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 28)... ...	16	827	22 6 4	1 7 7	6·58	Sole crop on *rabi* field.
Second do. (Exp. No. 29)... ...	8	281	7 9 7	3 12 5	49·69	Second crop on rice field.

Mr. E. H. Hearn, Deputy Superintendent, Konkan Revenue Survey,

Sends a test on sugarcane and another on lucerne.

The sugarcane experiment (No. 30) was taken on black clay soil, the subsoil of which is mixed with silt. The field is irrigable by Persian wheel from a well and is assessed at Rs. 4-7-7 per acre. It grows sugarcane or plantains in alternate years with rábed rice seedlings. *San* hemp is grown as a second crop in the same year as the rice seedlings. It is not reported whether the *san* hemp is grown as a green manure or not. In any case it would be a good preparation for either sugarcane or plantains, and this is probably the reason why no manure was applied for the sugarcane before plantation. Three top-dressings of castor cake were given—the first in July 2 months after plantation, the second in August, the third in September. The three applications cost Rs. 100 per acre. The cake was pounded fine, placed round the canes, and covered with soil. The variety of cane tested was dark-purple in colour. 2,200 whole canes cut into lengths of 1 to 1½ feet provided sets sufficient for an acre. The test area is less than the prescribed minimum, because the owner objected to having a larger area cut in one day. After the sets were planted the field was watered at intervals of 8 to 10 days except during the monsoon. It was weeded four times at intervals during the season. In October the canes were wrapped in their

own leaves and again in November, January and February. The canes were also tied up to each other to prevent lodging by wind. In March, 10 months after plantation, the crop was harvested. A wooden mill worked by two buffaloes was used to express the juice. The experimenter gives no details of the *gul*-making process. He reports that the crushed cane is only used as ráb and that the tops are useful as fodder. The kind of fuel used in boiling the juice is not noted. The crop yielded 5,789 lbs. of *gul*, which with the by-products valued at Rs. 10 per acre, was worth Rs. 262. This is estimated as a 14-anna outturn. Season and cultivation are each described as good.

This officer's second test (No. 31) was taken on lucerne. It is doubtful whether the results are any guide as to the burden of assessment. The crop was grown as a second crop after rice on deep black clay soil assessed at Rs. 3-14-9 per acre. In tracts of heavy rainfall lucerne is not a permanent crop. It is killed out by monsoon rain. The experimenter estimates that five cuts are obtained during the season of growth, the seed being sown in November and the crop ploughed up in the following May or June. Meantime the crop needs irrigation every 10 days in retentive soil. The crop tested was the second cut since sowing; the first would probably have been less in weight, and it is almost certain that the outturn at each cutting would be considerably less during the very hot weather. I cannot accept the outturn of the second cut as average for the others, particularly as the crop was only lightly manured, 6 cart-loads of goat's manure only being applied. The experiment goes to prove that the cultivation of lucerne within a reasonable distance of Bombay is profitable even though the crop is not permanent, the reason being that lucerne is exceedingly dear in Bombay during the fair season. The demand is mostly supplied by lucerne sent from Poona, and the cost of rail transport by passenger train (it spoils if sent by goods) is 9 annas per Imperial maund. It can only be profitably sent from Poona if the retail price in Bombay is 60—80 lbs. per rupee. The experimenter says the retail rate in Bombay for lucerne delivered in small quantities at bungalows is 56 lbs. per rupee. He values the outturn of his test area at the wholesale rate of 80 lbs. per rupee. The crop (one cut) yielded at the rate of 6,824 lbs. per acre worth Rs. 85-4-9.

Mr. A. G. Hudson, Assistant Superintendent, Konkan Revenue Survey,

Submits six tests on grass. Four of the fields selected for experiment are classed as *varkas* land, one is classed as rice land, and one as *rabi*. The rice field grew rice until 1884-85; subsequently it was allowed to lie waste for grass because it is a long distance from the village and the lands surrounding it grew grass only. The *rabi* field was entered as Government waste at the time of original survey. It was subsequently purchased by the occupant who says he allows grass to grow on it for ráb. He never grew a rabi crop on it, and thinks it will not grow one as the subsoil is *murum*.

Mr. Hudson in submitting his report gave no explanatory notes of his tabulated figures. He went on leave soon afterwards and a reference has failed to make all clear. *Ber* grass grew in the rice field and *phul* in the other fields experimented upon. The *ber* is valued at 125 bundles or 198 lbs. per rupee, the *phul* at 100 bundles per rupee. The rate of the *phul* grass in the first three tests ranges from 145 to 150 lbs. per rupee, but in the two next tests the respective rates are 84 lbs. and 240 lbs. per rupee. The latter rate is for an exceptionally heavy crop and the former for a light crop. No doubt a light crop yields a finer quality of grass than a heavy crop, the grass of the latter being tall and coarse. Still I do not see why, weight for weight; the fine grass should be three times as valuable as the coarse.

The anna valuations of two of the crops tested is much lower than that of the others. The season was alike favourable for all the fields. It looks as if the anna valuations were fixed by comparing the crops with those of other fields in the same district in the same year. The anna valuations should have been fixed by taking evidence as to the comparative values of the tested crops with former crops on the same numbers.

Mr. Hudson writing from England has been unable to clear the points referred to. He says: "The experiments were made on grass crops in various situations. It would have been as unfair to the Khátedárs if I had taken the best

situations as it would have been to Government if I had taken the worst. The experiments must consequently be read together for the average outturn to be determined."

I tabulate the outturn results as under :—

		Description of Grass.	Anna Estimate.	Outturn of dry Grass per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
			As.	Lbs.	Rs. a. p.	Rs. a. p.		
First	field (Exp. No. 32) ...	*Phul* or *Bondhani*	18	3,968	27 6 6	0 14 0	3·19	*Varkas* land.
Second	do. (Exp. No. 33) ...	Do. ...	20	4,110	28 0 0	1 11 11	6·25	Do.
Third	do. (Exp. No. 34) ...	Do. ..	20	4,004	32 11 6	2 0 0	6·11	Do.
Fourth	do. (Exp. No. 35) ...	Do. ...	11	1,764	21 0 0	0 11 6	3·57	Do.
Fifth	do. (Exp. No. 36) ...	Do. ..	20	4,760	19 12 10	0 2 10	0·94	*Rabi* land.
Sixth	do. (Exp. No. 37) ...	*Ber*... ...	11	3,164	16 0 0	5 4 10	36·71	Rice land.

The value of outturn is, I think, considerably over-estimated in the 4th test and is probably under-estimated in the 5th, but in the latter the grass may have been so coarse that the valuation is correct. Mr. Hudson, when doing the measurement of Kelve Máhim táluka, enquired into the grass trade of the district which supplies Bombay to a very large extent. He has submitted a very carefully prepared report which has an indirect bearing on the Thána tests and which I will endeavour to epitomize. He says: "The land which produces this grass was originally classed as *varkas* and assessed at 4 annas and less per acre. It is beautiful alluvial land and should never have been classed as *varkas* at all but as *rabi* which it undoubtedly is. It grows an excellent crop of *phul* grass in high situations and of *ber* and *roheda* in lower lying places, and the owners are lucky to have had it at a nominal rental for so long."

The following statements of sale of grass produce on lands in the Pálghar, Padghe, Kelve and Shirgaon Sájas show that the auction price obtained for the right of grass-cutting is on an average many times the assessment :—

Survey Number.	Kind of Land.	Area.	Assessment.	Amount realized in Auction Sale.	Name of Purchaser.
1	2	3	4	5	6
		A. g.	Rs. a. p.	Rs. a. p.	
		Pálghar.			
114	Jiráyat	27 3	5 0 0	155 0 0	Hari Prasád Mátádin Pardeshi.
135	Do.	25 20	5 0 0		
	Total ...	52 23	10 0 0		
		Shelwale.			
31	Jiráyat	13 30	1 12 0	17 0 0	Parsharám Mahádev.
		Ambádi.			
19	Do.	10 20	1 5 0	20 0 0	Chinto Gopál.
		Warkuti.			
55	Do.	26 0	2 8 0	5 0 0	Kanta Girdhári Pardeshi.
56	Do.	12 0	1 8 0		
58	Do.	18 0	2 4 0		
60	Do.	19 0	2 4 0		
	Total ...	75 0	8 8 0		

Survey Number.	Pot Number.	Kind of Land.	Area.	Assessment.	Amount realized in Auction Sale.	Name of Purchaser.
1	2	3	4	5	6	7
			A. g.	Rs. a. p.	Rs. a. p.	
			SA'JA PADGHA.			
			Umbroli.			
87	1	Kharif	3 1½	6 8 0	0 3 0	Kolsha Navsha.
			Morekuran.			
13	...	Jiráyat	15 0	2 12 0		
14	...	Do.	14 30	2 12 0		
15	...	Do.	15 10	2 12 0		
16	...	Do.	16 0	3 0 0		
17	...	Do.	14 0	2 8 0		
21	1	Kharif	2 22½	5 0 0		
22	1	Do.	1 35	4 0 0	60 0 0	Hari Prasád Mátádin.
25	...	Jiráyat	2 20	0 7 0		
26	...	Do.	3 0	0 9 0		
27	...	Do.	3 20	0 10 0		
28	1	Kharif	1 29½	4 0 0		
31	1	Do.	1 26	4 0 0		
60	...	Jiráyat	26 0	5 0 0		
		Total ...	117 32¾	37 6 0		
			Kolgaon.			
17	...	Jiráyat	15 0	1 14 0		
18	...	Do.	21 0	2 8 0		
19	1	Kharif	0 27¾	1 10 0		
20	...	Jiráyat	13 0	1 10 0		
21	...	Do.	18 10	2 4 0		
22	...	Do.	19 0	2 4 0		
32	...	Do.	16 0	2 0 0		
56	1	Kharif	2 12½	7 0 0	80 0 0	Hari Prasád Mátádin.
63	...	Jiráyat	21 0	2 8 0		
64	...	Do.	27 0	3 4 0		
65	1	Kharif	0 23¾	1 4 0		
71	1	Do.	2 6¾	4 8 0		
74	...	Jiráyat	1 20	0 4 0		
47	...	Do.	4 0	0 12 0		
48	...	Do.	2 0	0 4 0		
		Total ...	163 20¾	33 14 0		
			Nándore.			
27	1	Kharif	0 31¼	1 10 0		
28	1	Do.	2 ¾	4 10 0		
28	...	Jiráyat	0 25	0 1 0	No record, as these numbers were taken first for forest.	
29	1	Kharif	2 26¾	7 0 0		
30	1	Do.	3 18¼	8 8 0		
31	1	Do.	0 38¼	2 0 0		
32	1	Do.	0 7¼	0 6 0		
33	1	Do.	0 8¾	0 8 0		
34	1	Do.	0 10½	0 9 0		
35	1	Do.	1 14½	2 12 0		
19	...	Jiráyat	15 0	1 14 0		
66	...	Do.	19 0	2 4 0	107 0 0	Chintu Bháu Pátil.
73	...	Do.	18 ¼	2 4 0		
		Total ..	64 21¼	34 6 0		
			Padghe.			
91	...	Jiráyat	4 10	0 6 0	1 0 0	Gopál Krishna Dixit.
			SA'JA KELVE.			
			Tokráde.			
5	Nil	Jiráyat	23 0	2 4 0		
6		Kharif	2 23	4 8 0		
7		Jiráyat	22 0	2 12 0		
8		Do.	32 0	4 0 0		
9		Do.	27 0	2 8 0		
10		Do.	22 30	2 12 0		
11		Kharif	2 20¼	4 8 0		
12		Jiráyat	23 0	2 12 0		
13		Do.	30 20	3 12 0	865 0 0	Hari Prasád Mátádin.
14		Do.	21 0	2 8 0		
17		Do.	25 20	3 4 0		
18		Do.	26 0	3 4 0		
19		Do.	28 0	3 8 0		
25		Kharif	2 12½	4 8 0		
26		Jiráyat	21 0	2 8 0		
29		Kharif	0 20½	1 0 0		
33		Do.	0 88	1 10 0		
		Total	310 21¼	51 14 0		

Survey Number.	Pot Number.	Kind of Land.	Area.	Assessment.	Amount realised in Auction Sale.	Name of Purchaser.
1	2	3	4	5	6	7
			A. g.	Rs. a. p.	Rs. a. p.	
		Kelve.				
126	Nil.	Kharif	2 30	4 0 0	500 0 0	Hari Prasád Mátádin.
148		Do.	1 20¾	3 8 0		
180		Do.	2 31	9 8 0		
181		Do.	2 25¼	9 0 0		
260		Do.	2 10¼	4 12 0		
265		Do.	4 11¾	7 0 0		
266		Do.	0 33¼	1 12 0		
281		Do.	0 31¾	1 8 0		
293		Jiráyat	9 0	1 10 0		
327		Do.	25 33	5 0 0		
329		Kharif	2 21¾	5 0 0		
331		Jiráyat	35 7	6 8 0		
353		Do.	4 0	0 12 0		
359		Do.	13 20	2 8 0		
361		Do.	17 0	3 4 0		
362		Kharif	2 34¼	6 0 0		
363		Do.	2 25	5 8 0		
364		Do.	2 38¼	6 0 0		
366		Jiráyat	31 0	6 0 0		
367		Do.	26 0	5 0 0		
368		Do.	23 0	4 8 0		
371		Do.	22 12	4 3 0		
374		Do.	16 12	3 4 0		
383		Do.	24 0	4 8 0		
384		Do.	4 15	1 0 0		
387		Do.	9 23	2 0 0		
388		Do.	8 20	1 12 0		
389		Kharif	1 4½	2 4 0		
390		Do.	1 5	2 4 0		
391		Jiráyat	6 3	0 12 0		
442		Kharif	2 6¼	4 8 0		
437		Jiráyat	21 7	3 4 0		
500		Kharif	0 19¾	1 0 0		
503		Jiráyat	12 0	2 4 0		
505		Do.	30 23	4 0 0		
518		Do.	24 0	4 8 0		
519		Do.	20 20	3 12 0		
520		Do.	19 30	3 12 0		
540		Do.	18 0	2 4 0		
552		Do.	28 20	5 8 0		
564		Do.	19 14	3 12 0		
575		Kharif	2 18¼	5 8 0		
582		Do.	5 31¼	14 8 0		
		Total ..	511 26	179 1 0		
		SA'JA SHIRGAON.				
		Alyáli.				
46	1	Kharif	1 4¼	2 12 0	4 0 0	Kánta Girdhári Pardeshi.
48	1	Do.	1 33¾	4 8 0		
52	1	Do.	1 7¼	2 8 0		
		Total ...	4 5½	9 12 0		
		Tembháda.				
84	...	Jiráyat	20 6	3 13 0	120 0 0	Hari Prasád Mátádin Pardeshi.
85	...	Do.	20 30	4 0 0		
86	...	Do.	13 0	2 8 0		
		Total ...	53 36	10 5 0		
		Dipoli.				
4	1	Kharif	0 30¾	1 14 0	8 0 0	Hari Prasád Mátádin.
9	1	Do.	0 13¾	0 13 0		
30	1	Do.	0 27½	1 12 0		
56	1	Do.	0 ⅝	0 1 0		
62	...	Jiráyat	31 4	6 0 0		
63	...	Do.	33 10	6 0 0		
64	...	Do.	40 0	7 8 0		
65	...	Do.	36 0	6 8 0		
66	...	Do.	44 0	8 0 0		
67	...	Do.	44 0	8 0 0		
68		Do.	45 0	8 8 0		
69	...	Do.	30 0	5 8 0		
		Tota ...	305 6½	60 8 0		

Mr. Hudson saw 6 waggons loaded with *ber* hay at Pálghar, which carried 27,000 bundles. The freight charged on each waggon was Rs. 11. Mr. Hudson found the weight of a *ber* bundle to be 1·8 lbs. on an average and average girth 17 inches. *Roheda* bundles weighed 1·84 lbs. each and girthed 16½ inches. *Phul* weighed 1·24 lbs. per bundle and girthed 20·3 inches.

The following expenses were incurred for *ber* hay delivered in Bombay :—

	Rs.	a.	p.
Cutting, bundling and stacking 27,000 bundles at Re. 1 per 500 bundles	54	0	0
Carting to station at 8 annas per cart-load of 500 bundles	27	0	0
Loading 6 rail waggons	6	0	0
Unloading 6 rail waggons	3	0	0
Dalál's fees on 6 waggons	12	0	0
Freight charges to Bombay	66	0	0
	168	0	0
Price of 27,000 bundles of *ber* in Bombay at Rs. 14 per 1,000	378	0	0
Difference ...	210	0	0

Taking Mr Hudson's figures as to average weight of *ber* bundles, and considering the outturn results of his crop test it may perhaps be assumed that the 27,000 bundles weighing in the aggregate 48,600 lbs. were got from 15 acres of land, the assessment of which would be less than Rs. 4. It would have been, however, more conclusive if actual tests had been taken in the field. I can say with positive assurance based on personal observation that last year between Saphála and Pálghar most of the grass would certainly have yielded 1½ tons or more of hay per acre, and I can without any hesitation accept the statement that hay cut from 15 acres assessed at Rs. 4 would be worth to the registered owners of the field in Bombay Rs. 210 in excess of expenses incurred in harvesting and marketing. This represents an annual income of Rs. 14 per acre.

Mr. Hudson says "the grass pays so well that it is not worth the while of the owners to turn the more favourably situated portions of their fields into rice. Grass wants no attention and goes on improving year after year." Mr. Hudson further says *ber* grass seldom sells in Bombay for less than Rs. 14 per 1,000 bundles. It usually fetches Rs. 16 per 1,000; if the demand is great, Rs. 18. If the demand is very great it sells for even more. Similarly *phul* grass seldom sells for less than Rs. 12 per 1,000 bundles ; it usually fetches Rs. 14, and if the demand is great, Rs. 16 or more. Mr. Hudson bought grass for his own use at Pálghar at Rs. 7-8-0 per 1,000 bundles, and at Makimsar at Rs. 6-0-0 per 1,000 bundles.

Mr. Ozanne has made the following note :—"Mámlatdár says in the neighbourhood of Pálghar the dry-crop land is sublet for from Rs. 5 to Rs. 8 per acre for grass, the lessee bearing all expenses of watching, cutting, carting, &c. &c. The assessment is about 3 annas or 4 annas per acre. In this year Mámlatdár reported that 81 acres of *gurcharan* had been unauthorizedly occupied. The grass was put up to auction and fetched Rs. 520, besides local fund Rs. 32. The land is claimed and the money is in deposit pending decision. A Pársi was granted about 1,000 acres of *gurcharan* about 5 years ago for about Rs. 31,000. This year he sublet the land for the grass for Rs. 7,000."

CENTRAL DIVISION.

Kha'ndesh.

In this district each experimenter was requested to make two experiments on *bájri* and one each on wheat and sesamum. The programme has been fairly carried out. Less than the required number of tests on sesamum were taken because the crop was mostly harvested before the commencement of the touring season. Two experiments have been rejected for reasons given below.

Mr. K. R. Bamanji, Assistant Collector,

Reports two wheat tests (Exp. Nos. 38 and 39). Each field has black cotton soil. Both fields are assessed at practically the same rate, the acre assessments being respectively Rs. 2-15-2 and Rs. 2-15-1 per acre. The lower assessed field has an uneven surface and grew the worst crop. The fields are some distance from the village, but this is not the only reason why manure was not applied. Throughout the táluka fodder is scarce. The area of grazing is limited and large numbers of cattle are sent for the greater part of the year to the Sátpudas to graze and thus manure is scarce.

The first field grew during the last three years mostly rabi crops; wheat, sesamum and gram occupying in each year separate areas in the number. The sequence of cropping in the second field during the last three years was (1) cotton, (2) *bájri*, and (3) *jowári*, wheat and tobacco. No portion of either field is double cropped in any year. The season for wheat was unfavourable. There was heavy rain soon after sowing, which was harmful. There was rain again in January. The cloudy weather and high winds which accompanied the rain at this time unfavourably affected the wheat crop.

The results are tabulated below for comparison:—

	Anna Estimate.	Outturn per acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal product.	By-product.			
	As.	Lb.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 38) ...	16	661	897	17 12 1	2 15 2	16·60
Second do. (Exp. No. 39) ...	16	502	615	13 4 3	2 15 1	22·18

The burden of assessment is apparently not light. I think the crops might fairly be classed at a lower anna estimate or at any rate the land, if more liberally farmed, would give much better results.

Mr. J. H. DuBoulay, Assistant Collector,

Submits five tests—two each on *bájri* and sesamum and one on wheat. The experiments are clearly and fully reported. In each case the assessment is that of the original survey.

I will first contrast the *bájri* tests. The first field experimented upon (No. 40) has light red *madhyam barad* soil, assessed at Re. 0-5-10 per acre. During the last four years two crops of *bájri* and one of sesamum were grown. One year the land lay fallow. The tested crop "was a good sample of the ordinary *ódjri* grown without much care on the poorer land, of which there is a good deal in the Pimpalner táluka." No manure was applied and the cultivation is described as indifferent. The second field (Exp. No. 41) has good dark soil not quite dark enough to be called black. Still it grows cotton occasionally. The crops taken during the last four years were sesamum, cotton, *bájri*, and *kulthi*. The assessment is Re. 0-9-9 per acre. Comparing the crop with that of the other

field, the experimenter says it "is a good specimen of the produce of more careful cultivation and better land. There is plenty of the same kind of crop to be seen in the táluka". The cultivation is described as good. The field was manured with about 9 cart-loads of cowdung per acre. The field with the lighter soil required, as usual, a higher seed-rate. The respective rates were 8 lbs. and 5½ lbs. per acre. The latter rate is under average. In each field the seed was sown about the 1st of July and the crops were reaped early in November. The season was middling. Hardly any rain fell for six weeks in the middle of the monsoon. The field with lighter soil probably suffered more from the long break. The experimenter expressly states that the anna valuations in all his tests have reference only to previous crops on the same lands.

The *bájri* results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage incidence of Assessment.	Remarks.
		Principal Product.	By-product.				
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 40).	16	295	575	5 15 4	0 5 10	5·54	Light soil.
Second do. (Exp. No. 41).	20	829	2,905	20 15 0	0 9 9	2·91	Darker better soil.

The poor results in the one field and the satisfactory results in the other may chiefly be attributed respectively to poor and good farming.

Mr. DuBoulay exercised judicious discrimination in selecting the sesamum fields experimented upon and also in selecting his test areas. One of the fields (Exp. No. 42) has light red soil similar in class to that of the first *bájri* field, the assessment being Rs. 0-5-9 per acre. The second experiment (No. 43) was made on a distinctly darker and better class of soil. The assessment is Re. 0-10-11 per acre. This field grows cotton, *bájri* and sesamum in rotation. The other field grows these crops and also *kulthi*. This pulse is a common crop on very light land in Khándesh. It is difficult to understand how cotton can be grown successfully on such light soil unless manure is liberally applied and the rainfall is timely and sufficient. The sesamum like the *bájri* suffered from a long break in the rains. The light soil field was fairly manured with about 9 loads cowdung per acre. The cultivation otherwise was only fair. In this field the seed-rate is reported at 5 lbs. per acre ; in the heavier soil field, at 2 lbs. per acre. The latter rate should be ample for any soil. The seed is so small that a small quantity is sufficient if the seed is sown with sufficient care to secure even distribution.

The crop on the heavier soil field was much better on half the field than on the other, the difference being due to the effect of manure. Half the field was liberally manured with 24 carts cowdung per acre, and as regards the crop on this portion the experimenter says " I have not seen a better crop so far as outward appearances go." He further says "the unmanured portion is a fair sample of what may be seen in most of the better lands growing *tili* in the táluka." Test areas were selected in the manured and unmanured portions of the field and the outturn results as tabulated below form a striking contrast :—

	Anna Estimate.	Outturn of Seed per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment	Remarks
	As.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 42) ...	12	282	14 7 3	0 5 9	2·48	Light soil.
Second do. (Exp. No. 43).	19	496	23 11 2	0 10 11	2·87	Liberally manured portion.
	19	200	9 7 8	0 10 11	7·91	Unmanured portion.

This officer submits a test (No., 44) on unmanured irrigated wheat grown on shallow red *barad* soil with scattered stones. The land is classed as *bágáyat* and is assessed at Rs. 5-15-0 per acre. The field is irrigable from an irrigation channel and the water is available all the year round except at the end of the hot weather. A water-rate of 4 annas per acre for sugarcane and 2 annas per acre for other crops is charged in addition to the *bágáyat* assessment. The field grows sugarcane, rice and wheat in consecutive years. It is probable that the sugarcane is liberally manured. Yet the cultivator could hardly expect a good irrigated crop of unmanured wheat from land continuously under irrigation, and especially as crops of the cereal family are only grown and therefore no appreciation of the value of rotation is shown. I quote from the experimenter's report as follows:—"I cannot call the crop a representative one; for though there are similar *bágáyat* lands in the neighbourhood, a number of them have been allowed to lie fallow and only the best lands were put under wheat and then the wheat was not ripe. The wheat of experiment was a good 2 annas worse than the other *bágáyat* wheat in the neighbourhood which seemed to be on better land."

"On the whole I think the field over-assessed, and I am the more inclined to think so because in the neighbourhood of Dahivel the people universally complain with regard to waste *jiráyat* land that they cannot pay an occupancy price of five times the assessment. The land, they say, is so poor that they have to leave it fallow for three years after cultivating for three years. If there has been over-assessment of *jiráyat* the same error may have occurred with regard to *bágáyat*, but without accurate knowledge of the outturns from rice and sugarcane it is hardly possible to form a satisfactory opinion."

The wheat outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 44 ...	13	769	1,190	19 11 5	5 15 0	30·11

The grain is valued at the cheap rate of 41⅔ lbs. per rupee. The burden of assessment appears high, and if district officers believe this to be the case, a few tests taken on representative crops cultivated with average skill will tend to prove whether the burden is heavy or not. It certainly cannot be concluded that it is heavy from the results of a single test.

Mr. C. N. Seddon, Assistant Collector,

Reports two wheat tests. One crop was irrigated, the other was dry. I cannot accept the reported seed-rates as accurate. They are much above average. The dry-crop seed-rate is higher than that of the irrigated crop. Ordinarily the reverse would be the case. The respective rates are 108 and 94 lbs. per acre. In other respects the results are quite satisfactory and carefully reported.

The dry-crop (Exp. No. 45) was grown on black cotton soil, assessed at Rs. 2-10-8 per acre. During the last four years linseed, *jowári*, wheat and cotton were grown. These are the ordinary crops taken on black soil. They were rotated with each other but in no definite manner. *Udid* and *tur* are grown subordinate to *jowári*. Wheat with a sprinkling of maize occupied the whole number in 1894-95. The maize was removed before the wheat was ripe and probably was grown as a green fodder. It makes rapid growth under favourable conditions and a sprinkling would not interfere much with the slower growing wheat. The tillage was fairly good. A light dressing of ordinary manure, 5 loads per acre, was applied before the rains. The field was ploughed in July. The subsequent tillage is not referred to. Probably the harrow as

usual was used at short intervals during the monsoon season to keep the land free of weeds. The seed was drilled with a two-rowed drill in October. The season was fairly good.

The irrigated crop (Exp. No. 46) was not irrigated in the true sense of the term. Two waterings were only given late in the season. This is a common practice generally throughout the Deccan, not only for wheat but also for gram. No extra expense is incurred as with other irrigated crops except for watering. It is unnecessary to prepare the field for irrigation by forming beds or water compartments in the ordinary way. The water when applied is led over the field in the best way the cultivator can, and a good deal of water is required, because so much pours into the cracks and descends into the subsoil at once. The crop was irrigated from a well which was constructed three years ago. The cultivator has since been able to grow a greater variety of crops. In addition to the ordinary dry-crops of black cotton soil, groundnut, chillies, brinjals, onions and garlic have been grown. These crops, especially the two latter, require regular irrigation in the rabi season. The field bears an assessment of Rs. 2-9-5 per acre. The wheat crop was unmanured. If the crop had been regularly irrigated the cultivator would have been compelled to apply manure liberally. Because irrigation is costly and only a good irrigated crop pays. There was not such a real necessity for manure as the crop was only twice irrigated. All the same if manure had been applied, the outturn would probably have been considerably enhanced. The seed was drilled in October and reaped in the last week of February.

The results from each field are contrasted below:—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
		Principal Product.	By-product.				
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
Experiment No. 45 ...	18	803	960	30 7 0	2 10 8	8·76	Dry-crop.
Experiment No. 46 ...	14	779	888	29 6 0	2 9 5	8·81	Irrigated crop.

The rates are of the revision survey and the burden of assessment is very light.

Mr. S. B. Chitgubi, District Deputy Collector,

Submits three tests on wheat and three on *bájri*. Two of the wheat tests I report with some misgiving, because one sample *ser* weighed 7½ *tolas* more than the reported weight, whilst the other weighed 12 *tolas* less. The difference is not explained, excepting that the experimenter himself did not see to the fastening up of the sample bags, but instructed a peon to do so. This would be sufficient reason to exclude the tests from record, but there is almost clear evidence that the weights on which the experimenter based his calculations are correct. Each sample of grain was very good, the bushel weights are approximately the same, and it is, therefore, impossible that there could be any great difference in the weights of the respective sample *sers*. The experimenter reports the weights to have been 151½, 150 and 150 *tolas*, whilst the weights found in my office were 158, 138¼, and 149¾.

The wheat crops tested (Exp. Nos. 47—49) grew on black soil fields, assessed at, respectively, Rs. 2-12-5, Rs. 2-3-8 and Rs. 2-8-5 per acre. The rotations in each field are more or less undefined. It may, however, be accepted that cotton is the principal and rent-paying crop, and that *jowári*, wheat, gram and occasionally other crops are rotated with it. In the third field mixed cotton and indigo was the crop of 1893-94. The indigo would be a good preparatory crop for the tested wheat crop. Therefore there was no great necessity for manuring this field for wheat, and no manure was applied. The other fields were manured with 6 cart-loads per acre of cattle manure to the first field and 7 carts per acre to the other. Each field was carefully ploughed. The culti-

vation in each case is described as good and the season fair. The seed in each field was drilled about the middle of October in the first two fields, at the end of the month in the third. The seed-rates vary; all are above average; the respective reported rates are 65, 80 and 54 lbs. per acre. Almost exactly four months elapsed between seed-time and harvest: an indication that there was sufficient moisture in the soil and that the crops were not hastened to maturity.

The occupant of the first field (Exp. No. 47) cultivates in all about 30 acres, and pays Rs. 67 assessment. He has one hired servant, who gets Rs. 50 per annum. The family consists of 3 men, 2 women, and a 10-year old boy. The cultivator owes Rs. 700. In addition to two pairs of plough cattle, he owns 2 milk buffaloes and 1 cow: an indication that he is not hard pressed.

The owner of the second field (Exp. No. 48) occupies about 40½ acres as registered owner and rents under a lease 26⅔ acres, assessed at Rs. 48. The conditions of tenancy are not reported. He owns 3 pairs of bullocks, 1 cow, 1 milk buffalo, and 1 calf. The family consists of 3 men, 3 women, 2 girls, and 2 boys. Four servants at Rs. 5 per month each are employed. The cultivator is himself a servant of a banker; one son is a trader. Last year a son was married and a debt of Rs. 1,000 was incurred for the purpose. It is doubtful whether the land occupied, 67 acres, can be properly cultivated by 3 pairs of bullocks.

The owner of the third field (Exp. No. 49) occupies in all as registered owner 67 acres 23 gunthas assessed at Rs. 109. He has 8 bullocks, 1 milk buffalo, and 2 cows. The family consists of the cultivator, 3 women, 1 daughter, and 2 sons. He owes a debt of Rs. 600, but is apparently well-to-do as he owns a house worth Rs. 1,200. He employs two hired servants at Rs. 52 per annum, and does not work himself.

The outturn results from the wheat fields are in each case satisfactory. They are as under:—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 47) ...	16	772	1,231	25 6 8	2 12 5	10·92
Second do. (Do. 48) ...	16	904	1,292	29 6 5	2 3 8	7·58
Third do. (Do. 49) ...	18	696	1,313	26 11 10	2 8 5	9·44

The outturn results of Mr. Chitgubi's *bájri* tests are also of doubtful accuracy. The samples of grain sent to my office weighed respectively 2½, 3, 3½ *tolas* more than the reported weights.

The first field tested (Exp. No. 50) is rented by the cultivator. The terms of tenancy are not reported. The cultivator occupies other fields apparently as registered owner. The entire holding extends to 55⅞ acres, the assessment being Rs. 65. The cultivator owns 4 pairs work cattle, 10 cows, 5 calves, and 2 milk buffaloes. He has to buy fodder. He, however, plies one pair of bullocks and a cart for hire. The family consists of 3 men, 3 women, and 2 daughters. Four servants are employed, 2 at Rs. 5 per month and 2 at Rs. 50 per year.

The two other fields (Exp. Nos. 51 and 52) are cultivated by one man. One field he rents from an Inámdár, the other he owns. He also cultivates two other numbers. The entire holding extends to 69 acres 22 gunthas, the Government assessment being Rs. 71. He owns 3 pairs of work cattle, 3 cows, 4 calves, and 2 milk buffaloes. He buys some fodder and uses all he grows. The family consists of 4 men, 8 women, 5 sons and 7 daughters. The cultivator is a trader. He has built himself a new house which cost Rs. 800.

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He is a Ládsâka Bania by caste, and neither he nor the members of his family labour in the field. He has 6 paid servants, of whom 4 work in the field and 2 in trade. It is safe to conclude that the Inámdár landlord gets some advantage in renting his field to the Bania tenant, who does not work. It is also safe to conclude that the Bania tenant profitably cultivates the field by means of hired labour. Otherwise, he would not take the trouble to do so as he is not dependent upon the produce for a living. Under these circumstances the burden of assessment must necessarily be light.

In the first field four crops of *bájri* have been grown during the last four years. In the other two fields cotton is apparently taken when the early rains are favourable, *bájri* in other years. There was in each field one cotton crop and three *bájri* crops grown during the last four years. The season for each tested crop was fairly good. Tillage is described as good, but each crop was unmanured. The first field was sown in August, the other two in July. The seed-rates are below average, being respectively 5⅓, 4⅜ and 4½ lbs. per acre.

Outturn, &c., results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 50) ...	16	258	1,568	8 0 6	0 10 6	8·17
Second do. (Do. 51) ...	16	418	1,369	12 7 4	1 2 2	9·11
Third do. (Do. 52) ...	16	362	1,037	10 10 10	0 15 0	8·78

Mr. Kázi Kamruddin, District Deputy Collector,

Submits two tests on *bájri* and one on wheat.

The *bájri* in one of the fields had a slight sprinkling of *jowári*, in the other of *math*. Both subordinate crops were neglected.

The first field (Exp. No. 53) has fairly good red soil, assessed at Re. 1-4-0 per acre. It grows cotton occasionally, but is mostly cropped with *bájri* and subordinate mixtures. The second field (Exp. No. 54) has light *barad* soil of inferior description, more suitable probably for *bájri* than for any other crop. The assessment is Re. 0-6-3 per acre. The season was unfavourable. A long period of drought followed favourable early rains. The drought no doubt unfavourably affected the second field most. Each field is manured once in five years. The tested crop in the first field was directly manured. The second field was last manured in 1892. The cultivation of each field is described as good. The seed-rate, 4⅝ lbs. per acre, in the first field, is perhaps under-estimated; that of the second field, 9 lbs. per acre, is nearer average. The experimenter reports that the most of the *bájri* crops in his charge were harvested before the instructions as to taking experiments reached him on 16th October. The best *bájri* crops on black soil were already cut, and the fields selected did not grow average crops for the district. The principal product in the second test is valued at a considerably cheaper rate than in the first, presumably on account of its inferior quality.

The results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 53) ...	10	511	1,546	16 7 9	1 4 0	7·58
Second do. (Do. 54) ...	8	240	769	7 5 11	0 6 3	5·30

This officer's wheat test (Exp. No. 55) was taken on black cotton soil assessed at Rs. 2-6-6 per acre. Cotton, *jowári*, *bájri* and wheat have each been grown during the last three years, and three of these crops occupy different portions of the field in any particular year. The whole number extends to 11¼ acres, and wheat occupied this year three acres of the test field which was manured in May with about 8 cart-loads ordinary manure per acre. The cultivation is described as good, but in what respects is not shown. In Khándesh the preparatory tillage for wheat is usually very careful, and as manure was applied in May it is probable that the field was ploughed repeatedly during the monsoon. Careful preparatory tillage for wheat also benefits the cotton of the following year and is usually undertaken to free the soil of deep-rooted weeds which get established in cotton years. The reported seed-rate, 73 lbs. per acre, is decidedly over average. The seed was drilled with a heavy two-coulter drill in October. The crop ripened early in February. The season was favourable. The crop yielded well. 735 lbs. grain and 1,380 lbs. of useful by-product per acre are together valued at Rs. 26-3-2. This outturn is, I think, under-estimated at 12 annas.

Mr. Shitárám Dámodar, District Deputy Collector,

Submits two *bájri* tests, the results of which are not satisfactory and are not reported for reasons given below. The sample *sers* of grain in the first and second tests weighed in my office respectively 12½ and 4 *tolas* less than the reported weights. The experimenter's explanation is that the difference is due to dryage, and he says further that there was more dryage in the grain of the first test than in the second because in the second the grain "was better seasoned and more solid" when the crop was harvested. In effect the experimenter admits that the grain was measured before it had dried properly, and that the grain of the first experiment required more drying than that of the second, the latter crop being fully ripe when harvested. A difference of 12½ *tolas* per measured *ser* makes a difference of approximately 9 per cent in the gross outturn. The grain in each case is valued at the same rate in measure *sers* per rupee. The grain of the second experiment was decidedly the better sample. On reference it is explained that the buyer makes no distinction as to quality. If this statement is accepted, then the best sample was worth less in lbs. per rupee than the inferior sample, the respective rates being approximately 37 and 34 lbs. per rupee. *Bajri* straw and chaff are everywhere in the Deccan recognized as comparatively inferior fodder. In the first test the by-products are valued at 308 lbs. per rupee; in the second test, at Rs. 20-0-10 per acre or 136 lbs. per rupee. The latter is an exceedingly high rate. On reference the experimenter explains that Bhusával (in the neighbourhood of which the test was taken) is a very busy station, inferring, I suppose, that there is a keen demand for fodder. The *bájri* straw, he explains, is not brought freely to market, being considered the most nourishing food for cattle, and the owners store the *bájri* fodder and refuse to sell it unless a higher price is offered than for grass and other ordinary fodder. Notwithstanding this explanation, I consider the valuation exceedingly high.

Na'sik.

Eight experiments have been sent in by district officers from this district. Mr. Stewart could not do the rice test owing to his absence on leave. Mr. Carmichael found no opportunity to undertake the sesamum test, and so he did one on gram instead. The programme was fairly worked out. Mr. Lord's omission to experiment has not been explained.

Mr. Hampton, Assistant Superintendent, Deccan Revenue Survey, submitted 7 experiments, of which 3 have been omitted for reasons recorded. Mr. Ichhárám, Acting Superintendent, Land Records and Agriculture, C. D., forwarded 4 well reported tests, 2 on linseed and 2 on gram.

Mr. R. B. Stewart, Assistant Collector,

Submits a test on sugarcane and another on gram.

The sugarcane (Exp. No. 56) grew on a black soil field, assessed at Rs. 9-6-2 per acre for soil and water combined. The field is irrigable from a *bandhára*, the stream being perennial. The following is the ordinary rotation

of crops :—(1) maize and wheat, (2) groundnut, and (3) sugarcane. The variety of cane grown is *kade us*, a small hard sort, which, I think, is more commonly known as *vánsi* in Gujarát. It is reported that larger white canes will not grow on this land, and that the *gul* from the small canes, though less in quantity, is more valuable as it keeps better. The experimentor estimates the cost of cultivation at approximately Rs. 200 per acre, the manure applied being valued at 8 annas per cart-load. I think the cost of harvesting, crushing and boiling is over-estimated at approximately Rs. 135 per acre. These processes in the Poona district would cost much less even for a much heavier crop. In the memorandum of cost no charge is made for the labour necessary for the repeated waterings. The cultivator has a large family and a considerable number of cattle. He pays nothing for manure and all the labour except for *gul*-making is performed by members of the family. The cane was a 12 months' crop harvested in March. The season was excellent, and the cultivation good, 41 loads approximately per acre of ordinary manure having been applied. I do not think the reported seed-rate, 2,000 small canes per acre, would be sufficient. The crop yielded 8,000 lbs. of *gul* per acre. This at the cheap rate of 20½ lbs. per rupee was worth Rs. 390. There was no saleable by-product, the green tops being fed to the cattle working the mill. The cultivator bought this year a Poona iron-mill.

The gram test (No. 57) by this officer did not give satisfactory results. The field, which has black soil, is irrigable by *pat* from a *bandhára*, and bears a consolidated assessment of Rs. 8-12-0 per acre, is double cropped every year. Generally gram follows *bájri* or sesamum. Occasionally rice is grown. The tested crop was irrigated, but the extent of irrigation is not noted. Probably as usual the crop was only once or twice irrigated as it approached maturity. The rain crop was liberally manured with ordinary manure. The seed, 33 lbs. per acre, was broadcasted by hand in the furrow behind a plough. The season was excellent, but the crop was poor. It is assessed at 10 annas and yielded 431 lbs. pulse, which with the by-product is valued at Rs. 11-14-0 per acre. The market rate, 38⅓ lbs. of pulse per rupee, is low. The incidence, 73·68 per cent, is decidedly high even for a second crop.

Mr. G. Carmichael, Assistant Collector,

Submits two tests on gram and one on *jowari*.

The first and third tests may be compared. The field in the first experiment (No. 58) had friable black dry-crop soil assessed at Re. 1-8-11 per acre. It grows only one crop in a year. Wheat alternates with *bájri*, gram and linseed on different parts of the field. The test crop was manured with six carts of cattle-dung and town-sweepings per acre. Thirty-eight pounds of seed sown in the middle of October produced in 3 months 870 lbs. of pulse and 440 lbs. of useful by-product per acre, together worth Rs. 22-6-1.

Field in Mr. Carmichael's third test (No. 60) had similar soil 1½ foot deep, but impregnated with lime. It is assessed at Re. 1-8-2 per acre for soil and water combined and double crops are taken every year. *Bájri* is grown as a first crop followed either by gram or wheat, which are assisted by irrigation from a *kacha bandhára*. The gram under test was so irrigated, but its extent is not reported. Probably it was watered only once or twice as it approached maturity. No manure was applied to the field this year. Fifty-one pounds of seed drilled through a three-coulter tube in the middle of October gave at the end of February 946 lbs. of pulse and 385 lbs. of by-product, together valued at Rs. 20-2-6. The gram in this case is valued at a very cheap rate, 49⅕ lbs. per rupee as against 42 lbs. in the first test. The crop is certainly under-estimated at 12 annas. The incidence works out 7·49 per cent., which for a second crop seems quite low.

Shálu jowári with a sprinkling of safflower formed the subject of this officer's second experiment (No. 59). The soil is medium black assessed at Re. 0-9-6 per acre. *Jowári* alternates with *bájri* on this field. This year the field was lightly manured by folding sheep. The season was favourable except that the heavy rain in November laid the crop in places. Tillage is described as good. A poor crop was obtained. The outturn was only 171 lbs. of grain, and 865 lbs. of *kadbi*, together worth Rs. 6-11-2. The grain was very inferior in quality, and is valued at the cheap rate of 63 lbs. per rupee.

Mr. C. M. Thatte, District Deputy Collector,

Submits three tests, one each on *nágli*, rice and sugarcane.

The *nágli* (Exp. No. 61) was grown on red *mál* land assessed at Re. 0-4-3 per acre. It is apparently left one year fallow in three. It was fallow in 1892-93, and the crop tested was the second *nágli* crop taken since. The crop was raised as usual from rábed transplanted seedlings. The seed-bed was not rábed liberally, only branchwood and grass being used. No manure was applied to the field. Tillage is described as indifferent, but season good. I cannot accept the reported seed-rate as accurate; 2½ lbs. of seed broadcasted on a 1½ guntha seed-bed could hardly supply seedlings sufficient for an acre of transplantation. The value of the by-product is neglected by the experimenter, but this is more than counterbalanced by the high rate of the principal product. The reported market rate is 36½ lbs. per rupee. In this officer's next test taken in the same táluka he values *Kamod*, the finest variety of rice, at 45 lbs. per rupee. *Kamod* rice might easily be dearer, but could hardly be cheaper than *nágli* in the same market town almost at the same date.

The *nágli* was sown late and ripened late (end of November).

The outturn results are as under :—

	Anna Estimate.	Outturn of Grain per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 61 ...	14	1,168	32 0 0	0 4 3	0·83

The burden of assessment appears very light. The assessment is according to revision rates.

Mr. Thatte's rice test (No. 62) was taken on a black soil field, which is irrigable by *pát* and bears a revision assessment of Rs. 8-8-3 per acre. The field was green manured before transplantation, a crop of *san*-hemp (Crotolarea Juncea) being grown for the purpose. This was probably a better preparation for rice than a heavy application of manure, particularly if the green manure crop throve well. The *san* crop necessarily required a considerable time to grow; therefore, the transplantation of the rice seedlings was delayed until August. The crop ripened early in December. Apparently the field was laid out for irrigation by forming long narrow beds, each the length or width of the field, water being directed into each bed in turn. The extent of irrigation is not reported, but the experimenter says that usually water is given every second day. This is not likely. The field grows groundnut, rice and sugarcane in rotation. The season is described as fair, and the cultivation indifferent. It is not stated whether the seed-bed was rábed or not, but 50 lbs. of seed on 4 gunthas furnished seedlings for an acre of transplantation. Less seed might have sufficed. The outturn is quite satisfactory and might fairly be valued at more than 8 annas, which is the figure adopted by the experimenter.

Outturn results are as under :—

	Anna Estimate	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 62... ...	8	2,086	1,728	46 8 0	8 8 3	18·31

Mr. Thatte neglects the value of by-product; if added to the value of principal product the gross value of outturn would be considerably increased. The percentage incidence appears high, yet I feel sure the burden of assessment is

quite moderate. It is certainly so, if the supply of *pát* water is perennial. This appears probable. Otherwise, sugarcane would not be grown one year in three.

I must reject Mr. Thatte's sugarcane test. He exercised poor judgment in selecting his test area. It extended to 7¼ gunthas and was the remnant of a crop which covered 2 acres 12 gunthas of the field. The experimenter could not possibly know whether the test area was average for the field because the greater portion of the crop had already been harvested. The outturn results are poor. The value of *gul*, Rs. 131 per acre, would not certainly meet cost of cultivation, as the crop was liberally manured and otherwise well cultivated. The percentages of *gul* to juice and to cane are much under average. A reason for this no doubt existed, and could have been found out if proper enquiry had been made. The same variety of cane on an average under ordinary conditions yields twice the reported percentage of *gul*.

Mr. G. H. Hampton, Assistant Superintendent, Deccan Revenue Survey,

Submits five tests on sesamum and two on rice. The test areas of the former, with one exception are below the prescribed minimum. Four experiments were conducted on white *til* and one on red. Only one sample *ser* of each variety was forwarded to my office. The experimenter errs in supposing that all sample *ser's* of the same kind of grain must weigh the same. The weight will vary with the quality and dryness of the grain. I can only report two of the sesamum experiments, *viz.*, those in which the acre averages are deduced from actual weights of measured samples. These two experiments give the worst results, the outturn in each case being comparatively poor.

The first experiment (No. 63) refers to white *til*. The field has good *barad* soil but shallow and mixed with loose *murum*. It is irrigable by a *pat*. The assessment for soil and water combined is Rs. 5-13-4 per acre. The occupant intended to grow wheat as a second crop after the *til*, and the wheat crop would, of course, be benefited by irrigation, whereas the *til* was not, as it was wholly a rain crop. Therefore, the assessment chargeable against the *til* crop would only be a proportion of the soil rate, and that proportion would certainly be less than Re. 1 per acre. The field grew sugarcane in 1893, an indication that the *pát* supply of water is permanent in an average season. The field was liberally manured for the sugarcane, but no manure was applied for the sesamum, and probably none was needed. The cultivation is described as good. But a long drought in the middle of the season and heavy rain at the end were unfavourable for sesamum. The reported seed-rate, 4½ lbs. per acre, is quite four times as much as was necessary if the seed was sound and carefully sown. The crop is said to have been sown in June and reaped in November. Usually *til* does not take nearly so long to ripen and generally is sown much later.

The red *til* experiment (No. 64) was taken on light *barad* soil assessed at Re. 0-10-0 per acre. The field grows *bájri*, linseed and *til*. In 1893 a rain crop of *bájri* was followed by a rabi crop of linseed. Probably I think because *bájri* was more or less a failure, as it was generally in that year. The season was unfavourable. The rainfall was not well distributed, and the young seedlings nearly withered during drought. The field was well tilled, but is never manured. The seed-rate, 2½ lbs. per acre, is in this field also over average. The dates of seed time and harvest reported are about the same as in the other field.

The standard adopted in forming the anna estimates is not known. The experimenter retired from service before a reference could be sent.

The outturn, &c., results from each field are as under :—

	Anna Estimate.	Outturn of Seed per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p	
First field (Exp. No. 63) ...	10—12	275	14 13 6	5 13 4	39·29
Fourth do. (Exp. No. 64) ...	12	108	5 1 8	0 10 0	12·24

I give below the reported results of the test, which for reasons given I cannot include in the tabulated statement :—

	Anna Estimate.	Outturn of Seed per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
	As.	Lbs.	Rs. a. p.	Rs. a. p.		
Second field	10—12	355	19 2 3	6 12 11	35·56	White *til* to be followed by wheat. Sugarcane in the previous year. Assessment for soil and *pát* water. *Til* got no benefit from water.
Third do.	10—12	587	31 10 3	6 0 0	18·95	Do. do.
Fifth do.	12	326	17 9 3	0 11 0	3·91	Same crop to be followed by wheat or gram. Sugarcane in the previous year. Field irrigable from Irrigation Department channel; water paid for when taken.

Probably the assessment for soil in each of the above fields does not vary much, being probably less than Re. 1 per acre in each case. The soil of each field is light, free working and reddish, that of the second field being deepest and best.

This officer's rice experiments (Nos. 65 and 66) were conducted in the same village and on almost similarly classed land. The respective rates for soil and water are Rs. 7-0-5 and Rs. 7-0-3 per acre. Both fields are low-lying. The soil in each field is of like consistence and colour, but that in the second field is reported deepest and best. *Kamod* rice was grown in each field. This fine variety needs much water. The fields are irrigated by channel from a *bandhára* and the season is described as excellent, as there was an ample supply of water above the *bandhára*. Both fields grow rice, sugarcane, *til* and *bájri*, the two last followed by a second crop in the same year of wheat or gram. In neither field is there any fixed rotation. Neither crop was directly manured. It is not reported what crop preceded the rice in the first field, but in the second field sugarcane was grown in 1893, and the residue of manure from that crop no doubt benefited the rice. The crop in the first field had gone to straw more than grain and was lodged. It was grown from broadcasted seed. The seed-rate, 24 lbs. per acre, for a broadcasted crop, appears small. The crop of the second field was grown from transplanted seedlings. *Til* had been sown but failed in this field and the occupant bought rice seedlings to replace the *til* which had been ploughed up.

The outturn, &c., results are as under:—

	Anna Estimate.	Outturn of Grain per Acre.	Value of Outturn per Acre.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 65) ...	16	902	26 2 9	7 0 5	22·37
Second do. (Exp. No. 66) ...	16	1,523	43 5 9	7 0 3	13·47

The straw was left on the field to rot and act as manure for the following crop. Its value is neglected. The above results clearly show the advantage of growing rice from transplanted seedlings rather than from broadcasted seed. Coarse varieties may do fairly well if grown from broadcasted or drilled seed, but fine varieties like *Kamod* must be transplanted, or the results will be poor.

Mr. Ichhárám Bhagvándas, Ag. Superintendent, L. R. and Agriculture, C. D.,

Reports four carefully conducted crop tests, two on linseed and two on gram.

The linseed fields (Exp. Nos. 67 and 68) had each *káli bhurat* soil, *i. e.*, black tinged with yellow-brown. The respective assessments are Re. 1-5-0 and Re. 1-11-6 per acre. The higher assessed soil is denser and more retentive of moisture than the other, and grows cotton in rotation with sesamum, *bá'jri* and linseed. The lower assessed field grew *til* and *kulthi* in 1891, *shá'lu* or rabi *jowá'ri* in 1892, and kharif *jowá'ri* in 1893. Both fields were well ploughed during the monsoon season and liberally manured for the tested crops. Season in each case was favourable. The seed in each case was seasonably sown in October by a light drill, 9 and 8½ lbs. per acre being the respective seed-rates. Each crop was harvested on the 8th February.

The outturn results are as under :—

	Anna Estimate.	Outturn per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
	As.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 67).	16	207	12 8 5	1 5 0	10·47	Manured with 10 cart-loads per acre.
Second do. (Exp. No. 68).	20	297	17 14 8	1 11 6	9·59	Do. 20 carts.

The gram crops tested (Exp. Nos. 69 and 70) by this officer yielded poorly. The fields have each *káli bhurat* soil. They are, however, rated at a higher rate than the linseed fields, the respective assessments being Re. 1-13-8 and Re. 1-14-2 per acre. In each field gram was a second crop after *bá'jri*, occupying the whole of the first field but only a portion of the second. Second crops have not been grown on either field during the last four years. The late rains were favourable and this presumably induced the cultivators to sow gram. The first field during the last four years has grown cotton, *jowá'ri*, *bá'jri* and linseed. The second field during the same period has grown one crop of cotton and *bá'jri*, with and also without subordinate pulses in the other years. The gram was not directly manured in either field, but the previous *bájri* rain crops were each liberally manured with respectively 19 and 20 cart-loads per acre of Málegaon municipal manure. The seed was in each case sown by hand in October in the furrow behind a plough. The respective rates are 59 and 64 lbs. per acre. I think the anna estimates in the gram tests especially and perhaps also in the linseed tests are pitched too high.

The outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 69).	14	215	150	6 13 2	1 13 8	27·17
Second do. (Exp. No. 70).	16	175	150	5 10 0	1 14 2	33·51

Mr. Ichhárám refers at considerable length to some local usages which are of general interest. I will summarize part of his report and give the following *in extenso* :—

"In Málegaon the seed for sowing is usually obtained from a *Váni* money-lender on what is called the *vádhi didhi* system, that is, the seed is to be repaid in kind at harvest at one and a half times the quantity given. In the case of cotton the practice is that for one *palla* (120 weight *sers*) of seed supplied, the cultivator is to repay it in kind at harvest by giving one maund of seed-cotton. A maund of seed-cotton (lint and seed) is ordinarily equal to forty weight *sers*, but the *Váni* money-lender takes it at 44 *sers* for this repayment. The price of seed-cotton is this year exceedingly low, only Rs. 5 per maund of forty weight *sers*, and the difference of value of seed obtained and seed-cotton repaid is not material. With the price of seed-cotton at the rates of previous years, *viz.* Rs. 7 or Rs. 8 per maund, the difference would be considerable.

"When a cultivator is in need of money during the rains for cultivation and household purposes, the *Váni* money-lender as a rule declines to lend it on interest. But the usual practice is that he gives a loan, say of Rs. 20 to Rs. 50 or more according to requirements, on what is locally called the *jalap* system. Under *jalap* a condition is made that the loan should be repaid in kind at the next harvest, the quantity of produce given representing the value of the loan at certain prices which are fixed at the time of giving the loan and which are considerably lower than the ruling prices. Thus, for instance, the owner of Survey No. 92 under experiment obtained a loan of Rs. 60 on *jalap* about *Diváli* (October) for reaping *bájri*, cotton, &c., on condition that he should repay it in kind by supplying linseed at harvest at Rs. 9 per 63 measure *sers* (200 lbs.). Linseed fetched on the date of experiment Rs. 12 per 63 measure *sers* (200 lbs). The former is an exceedingly cheap rate and the latter about an average rate. The *Váni* gained a considerable advantage inasmuch as the risk of linseed being cheaper than 200 lbs. per Rs. 12 was not great. The actual advantage was a return of the money advanced and 80 per cent interest for five months. This practice of obtaining loans on the *jalap* system as described above must obviously be ruinous to cultivators by seriously crippling the profits of husbandry and of their hard labour, and deserves careful consideration in connection with the important question of agricultural indebtedness which is now being ventilated all over India.

"The owner of Survey No. 48 under experiment got his land by purchase from another cultivator, about two years ago. He paid a sum of Rs. 700 in cash for two fields containing in the aggregate 19 acres 12 gunthas of dry-crop land assessed at Rs. 36-12-0 as shown in the margin. The purchase price is nearly twenty times the assessment and as the land is purely dry-crop land its value could not have been much enhanced by any improvements made by the old occupant."

	A. g.	Rs. a. p.
Survey No. 48.. (Pot No. 1)	7 38	14 12 0
Survey No. 58...	11 14	22 0 0

Mr. Ichharam reports that the season for crops other than cotton was fairly good. But for cotton it was exceedingly unfavourable, the reason being that the rain for sowing and for some time subsequently was very deficient. The crop being damaged past recovery in many fields was uprooted to make room for *bájri* and other crops which could be sown seasonably later. Moreover, even in the fields that were left the heavy rain of October was decidedly injurious, causing immature bolls to fall from the plants. Mr. Ichhárám reports that the cultivators believe that the prospects of the cotton crop greatly depend upon the dates of sowing. A 20-anna crop is expected when the seed is sown in *Rohini* (23rd May to 5th June), a 16-anna crop when sown in *Mrig* (6th to 19th June), and a 12-anna crop when sown in *Ardra* (20th June to 3rd July). There is no doubt a decided advantage in sowing early, because if germination is good the crop is almost sure to do well. But if the seed does not germinate well, no great harm is done because it is cheap and there is time to substitute another crop before the season is too far advanced. If sown late, cotton rarely succeeds, particularly on the lighter descriptions of soil because there is certain to be deficiency of moisture in the soil before the crop reaches maturity and rain late in October is always harmful, chiefly because it comes when the bolls of early sown crop are opening. The lint of the ripe bolls is thus discoloured and the immature bolls fall to the ground.

Mr. Ichhárám gives a local saying or proverb thus :—

"If rain falls in *Swáti* (22nd October to 3rd November) it will be difficult to get even cotton wicks for lamps, but this rain helps in producing pearls. The allusion to pearls refers to the common Hindu belief that the drops of *Swáti* rain when taken in by fish of the Bay of Mannar turn into pearls."

Ahmadnagar.

Experiments on *bájri* were ordered from this district. Mr. Brooke did not conduct any and no explanation has been given. Mr Sorábji's tests have been omitted owing mainly to very poor results.

Mr. Sorábji Padamji, Assistant Collector,

Submits three *bájri* tests, which as a guide to the burden of assessment are of no value. *Bájri* was the principal crop of a mixture in each field. The

first field grew seven subordinate crops, the second four, and the third four. None of the subordinate crops were tested. The season for *bájri* was poor. Excessive rain spoiled the *bájri* at the flowering stage. The effect of rain on *bájri* at this time is to prevent fertilization as the stamens hang outside the efflorescence and their fertilizing power is certain to be destroyed by heavy rain. No other cultivated crop is affected in the same way, and probably the subordinate crops were less injuriously affected or they might not have been injured at all. The soil of each field is red soil of a light description overlying *murum*. It is not reported whether the subordinate crops promised well or otherwise.

The respective assessments and the values of *bájri* outturn from each field are shown as under :—

	Assessment per Acre.	Gross Value of Outturn per Acre.
	Rs. a. p.	Rs. a. p.
First field	0 9 3	3 2 0
Second do.	0 9 1	3 8 0
Third do.	0 4 7	1 12 8

The results are not recorded in the tabulated statement.

The second and third fields are sublet, $\frac{1}{5}$ of the produce going to the owner and $\frac{3}{5}$ to the tenant; $\frac{2}{5}$ of the seed is found by the owner, who also pays the assessment. All other expenses are met by the tenant. The fields usually grow either *jowári* with subordinate rows of safflower or *bájri* with subordinate pulses, oil-seeds and fibre plants. It is probably impossible to find a light soil field in the Ahmadnagar district in which there are no mixed minor crops. The minor as well as the principal crops should be tested if the test is intended to gauge the burden of assessment. The entries in Mr. Padamji's tabulated statement show that on the description of soil selected for experiment; *jowári* with a single subordinate crop, safflower, is commonly grown. It would not be at all difficult to test *jowári* and safflower in the same field as they ripen within a reasonably short time of each other. A test of this sort would have some value, whilst a test on one crop of a mixture in a year unfavourable to the tested crop has really no value.

Mr. V. B. Vádekar, District Deputy Collector,

Sends three tests (Exp. Nos. 71—73), all on *bájri*. I have some hesitation in reporting these tests, because (1) the test area in each case is below the prescribed minimum, being six gunthas instead of eight; and (2) because the anna valuations were made by comparing the crops with other crops in the same district and not with reference to previous crops on the same fields. The yields vary, because the fields differ in natural advantages. This is no reason why the anna estimates should differ. Other conditions being equal, the anna valuations should all be the same, and apparently should have been fixed about the average standard, because the experimenter reports the *bájri* crops of the district were about average.

Each crop had subordinate to it *tur* and *ambádi*, apparently a sprinkling in each field, which did not promise to yield much. The subordinate crops were not tested, and this is another reason why the experiments are of no great value.

All the tests were taken on the same day. This was possible, because the selected fields were in close proximity. I judge of the proximity of the fields, because they were all in the same village, and the Survey Nos. are 30, 31 and 37. It is only an off-chance that three fields lying close together will fairly represent average crops on similarly classed land throughout a district, and unless an experimenter has special reasons he should select fields at considerable distances apart. Of course, there is less trouble in selecting fields close together.

The first field had red brown soil apparently of better quality than that of the other two fields, though of somewhat similar class. The rainfall was favourable throughout. All the fields were well ploughed and harrowed. Weeding was neglected in the third field, and this re-acted on the outturn—a circumstance which ought to affect the anna valuation. Each field was sown during the first

fortnight of July and reaped on 18th November. The seed-rate in each case was 8 lbs. per acre.

The outturn, &c., results are as under:—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 71) ...	13	314	676	8 7 1	0 11 . 2	8·26
Second do. (Exp. No. 72) ...	11	198	415	5 6 4	0 7 0	8·10
Third do. (Exp. No. 73) ...	8	136	410	3 15 3	0 6 8	10·54

Poona.

The programme settled for this district was fully carried out, six experiments having been received on the crops selected.

Mr. Mollison, Superintendent of Farms, also conducted three tests on onions at Chákan in the Khed táluka.

Mr. H. W. J. Bagnell, Assistant Collector.

Reports one test each on rice, *nágli* and *bájri*.

The rice (Exp. No. 74) was grown on rice *gadhi* land assessed at Rs. 2-0-3 per acre. The variety grown was *sál*, an inferior early ripening sort. The crop was raised from transplanted seedlings. It is not reported how the seed-bed was prepared. Cowdung was applied to it and also to a small portion of the field, but the greater portion of the field was unmanured. Presumably the test area was selected in the unmanured portion. The cultivation is described as indifferent, weeding being more or less neglected. The field is double cropped on an average one year in two, gram being the second crop when the late rains are favourable. The rainfall was ample and seasonable for the rice, and as the October rains were heavy probably gram followed the tested crop. The experimenter reports the average seed-rate as 64 lbs. per acre. This rate is high for a district of moderate rainfall. The grain is valued at a cheap rate, *viz.*, 64 lbs. per rupee.

The outturn results are as under. They are not bad for a carelessly cultivated unmanured crop:—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p	
Experiment No. 74 ...	16	1,170	1,720	20 2 6	2 0 3	10 00

Nágli (Exp. No. 75) on *mál varkas* land assessed at Re. 0-6-2 per acre yielded well. The field is reported to lie fallow one year in five, but it is probable that the period of fallow is really longer. Since the field lay waste one crop of *til* (sesamum) and three consecutive crops of *nágli* have been taken, the crop experimented upon being the third. It is, I think, doubtful whether sesamum was really taken in the first year after fallow. It is more likely to have been niger-seed (*khurásni* or *kála til*). That, at any rate, is the usual oil-seed grown on *varkas* land. The tested crop was grown from rábed transplanted seedlings. The field was well ploughed before transplantation of seedlings, but was not manured. The rainfall was ample and seasonable. The reported seed-rate, 20 lbs. per acre, is much more than is necessary. The 20 lbs. are supposed to be equivalent to 10 *sers*, but 10 *sers* would be equivalent to 22 lbs. if the seed sown was of the same quality as that reaped, as a *ser* of the grain weighed 85 *tolas*.

The outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 75 ...	16	942	1,025	19 14 4	0 6 2	1·93

The *bájri* crop tested (No. 76) by this officer grew on *khárvat chopan* soil which requires a lot of rain to produce a full average crop. The field lay waste in 1892-93, and has not been ploughed since, the harrow only being used. A field which lay waste in 1892, and has not been ploughed since, must necessarily be well stocked with weeds. Therefore, although the cultivation is described as indifferent, it might probably be described as bad. *Bájri* followed *bájri* during the last two years, and no manure was applied to the tested crop. The season was favourable. The seed was sown early in August and the crop reaped in November. The outturn estimated at 12 annas is better than the cultivator could reasonably have expected. The crop yielded 522 lbs. grain and 1,220 lbs. by-product per acre, together worth Rs. 15-15-7. The assessment is Re. 1-6-2 per acre and the incidence works out 8·67 per cent.

Mr. A. S. A. Westropp, Assistant Collector,

Reports three tests, one on *nágli*, one on mixed *jowári* and safflower, and one on gram. I cannot report the last. The acre averages are based upon a local *ser* measure of the pulse weighing 102 *tolas*, whilst the sample *ser* forwarded to my office weighed 124 *tolas*. This would cause an increase in the acre outturn of more than 20 per cent over the reported figures. The experimenter suggests that the increase may be due to absorption of moisture during damp weather, but the sample was weighed on the 23rd March, and no moisture could have been absorbed at the time.

The *nágli* experiment (No. 77) was conducted on light coloured friable soil, *mulshi*, which slopes to a *nála*, and is terraced at intervals with stone *táls* probably to prevent surface wash. The tested crop was the second *nágli* crop after the land lay fallow. The interval between fallows is irregular. The cultivator apparently allows the field to lie waste only as often as he is obliged to, *i. e.*, when the soil gets exhausted. The first *nágli* crop after fallow was poor. That is the reason why two *nágli* crops in succession were grown. No manure was used directly for the tested crop. It, however, was grown from seedlings raised in a rábed seed-bed. Cowdung and branchwood were used as ráb materials. The tillage was careful. There was sufficient rain at first, but not enough late in the season. The *nágli* grain is reported to be exchanged in the district for onions and wheat—an indication that the parties to the exchange are in easy circumstances, the exchange being made obviously to increase the variety and improve the food available for home consumption.

The crop yielded 1,309 lbs. of grain per acre, which with the by-product was valued at Rs. 27-14-11. The revision assessment is Re. 0-7-0 per acre and the incidence only 1·56 per cent. The original assessment was Re. 0-4-7 per acre.

This officer's test (No. 78) on mixed *jowári* and safflower gave rather poor results. In the eastern division of the Poona district the *jowári* crop was below the average considerably, partly owing to failure of late rains and partly to cloudy weather. The crop in the district is generally sown late and partakes as much to the rabi season as to the kharif. The tested crop was sown in September. The field selected was reported to be the best land in the village. It grew a good crop in the previous year. This year the crop was uneven. Count was taken of this and an average got by selecting different test areas. Mr. Westropp thinks that the crop was slightly above the average of the season for the subdivision. The *kardai*, subordinate to the *jowári*, was quite up to the average of

former years. Three consecutive rows of *kardai* alternated with twenty-one of *jowári*. The field has black soil which is, however, stony. No manure was applied. The tillage is described as careful. The crop, estimated as an 11-anna one, yielded 104 lbs. of *jowári* and 89 lbs. of *kardai* per acre, which with the by-product is valued at Rs. 7-0-11. The assessment is Re. 0-7-11 per acre and the percentage incidence works out 7·01.

Mr. J. W. Mollison, Superintendent of Farms,

Submits three tests on onions. The results indicate that the burden of assessment is very light.

The crop selected for the first test (Exp. No. 79) probably represented as good a crop as was grown in the village. The crops on many of the fields, however, were exceptionally good and showed evidence of the most careful cultivation. The cultivation of onions is rapidly extending in the Chákan, Khed, and Junnar circles, because of the failure of potatoes during the past four or five years owing to "ring" disease. The substitution of onions for potatoes will, I think, prove profitable to the cultivators. There ought to be no difficulty in finding a good market for the produce, because onions are largely consumed by the labouring population. Moreover, there is a considerable export trade from Bombay to Zanzibar, Japan, &c. At present only the choice pure white variety grown largely in the Násik district is exported. I think the cultivators in the Poona district would find it to their advantage to grow this variety instead of the coarser red variety commonly grown. In almost every field at Chákan and Khed there is a small mixture of the white variety with the red, and the former grow to as large a size as the latter. I have selected this year a number of bulbs of the white variety, also of a superior yellow variety, and on the Poona Farm will, in a year or two, be able to produce a quantity of pure seed of each of these varieties, which will be available for distribution.

The field has mixed black soil suitable for any irrigated crop, and specially suited for onions. The kharif season was unfavourable. Groundnut failed owing to heavy early rain, and *bájri* which was subsequently sown was also a comparative failure, chiefly owing to heavy rain at harvest time. Generally groundnut is taken one year followed by *bájri* and onions the next.

The field was twice ploughed and twice harrowed for the onions, and then ridged up with a two-bullock plough. Beds were formed by hand. The beds were flooded before the seedlings were transplanted, and seedlings were planted in the soft mud about three inches apart. The seed was broadcasted in the nursery beds in October, and the seedlings were ready for transplantation in December. 8·9 Chákan measure *sers* of seed were required for an acre of transplantation. The equivalent in lbs. is not known, but probably 15 to 17 lbs. per acre of transplantation were required. The nursery practically transplanted ten times its own area. It was flooded a few days before the seedlings were removed, so that the seedlings were lifted without damage to the roots. Half the length of the tops was clipped off as usual before transplantation. About a month after transplantation, the field was hand-weeded and the crop top-dressed with ordinary well rotted manure, the application being equal to about 17 large four bullock-carts per acre. The capacity of the carts is about 40 cubic feet. The crop was again hand-weeded about a month after manuring. It was watered from a well in the field three times a month for the first three months. There was no water in the well in April and for the last watering the owner brought water from wells about a mile distant. For this watering which was given a fortnight before the crop was harvested, seven *mots* worked for two days, and a great deal of water was lost by leakage, because the channel ran through fields which had cracked very much. This necessitated the employment of a number of men to prevent leakage as far as possible. The crop was ripe on the 5th of May. It consisted chiefly of red onions, but there were a few white and a few yellow ones. A sample of over 30 lbs. lost by dryage in 18 days about 11 per cent in weight. This is allowed for in the outturn figures. The loss is perhaps more than a cultivator would incur, because he hastens to sell the produce in order to get as large a weight as possible. The following is approximately the cost of cultivation, ordinary rates being charged for manual and bullock labour.

Area under onions—2,178·89 square yards.

	Rs.	a.	p.
Ploughing twice; 2 days with 6 bullocks, 1 man and 1 boy; bullocks Rs. 3; manual Re. 0-12-0 ...	3	12	0
Harrowing twice; 1 day with 4 bullocks and 1 man; bullocks Re. 1-0-0; manual Re. 0-4-0 ...	1	4	0
Ridging 1 day; 1 two-bullock plough; bullocks Re. 0-8-0; manual Re. 0-4-0	0	12	0
Making beds; 4 men for 1 day	1	0	0
Preparing nursery seed-beds, inclusive of manure ...	3	0	0
Seed and sowing	2	10	0
Watering and weeding nursery seed-beds ...	2	8	0
First watering of field; 1 man and 4 bullocks at *mot*, 1 man repairing water channel and preventing leakage, and 1 man distributing water to beds for 2 days; bullocks Rs. 2-0-0; manual Re. 1-8-0.	3	8	0
Planting; 9 women for 2 days	2	4	0
First weeding	2	0	0
Second weeding	2	0	0
Eight cart-loads of manure, at Rs. 3	24	0	0
Spreading do.	0	4	0
Nine waterings; 2 men and 4 bullocks for 1 day for each watering; bullocks Rs. 9-0-0; manual Rs. 4-8-0	13	8	0
Last watering 7 *mots*; 1 man and 4 bullocks for each *mot* and 22 extra men for 2 days; bullocks Rs. 14-0-0; manual Rs. 14-8-0	28	8	0
Lifting	7	14	0
Total Rs. ...	98	12	0
Value of produce per Acre	235	0	0
Rs. a. p.			
Cost of cultivation per Acre ... 219 5 6			
Assessment per Acre 2 9 0			
Total cost per Acre ...	221	14	6
Profit per Acre ...	13	1	6

It is certain that a good deal of the labour employed was household labour, and that extra labour was probably paid for in the usual give-and-take manner. In any case the cultivator has not only made a fair profit (which would have been larger if the cost of the last watering was not unusually high), but is credited with fair wages for himself, his family and the ordinary hire rates for his bullocks.

The soil of the field selected for the second test (Exp. No. 80) is lighter than that of the previous field tested, but is well adapted for irrigated crops. The whole number is *bágáyat* with an area of 3 acres 20 gunthas, all of which is commanded by a well. Ordinarily the water is insufficient to irrigate the whole area; consequently part of the number usually grows dry-crop only, whilst in the remaining portion groundnut, sugarcane, brinjals, chillies, and onions are rotated with each other.

The portion under onions grew *bájri* as a rain crop. The *bájri* was reported poor. In the previous year groundnut was grown. The field is owned by a minor and is cultivated by his uncle. The crop was poor compared with most of the other onion crops of the village and was selected for test to show the difference between a really good crop and a middling one. The inferiority was in part due to the shade of boundary trees. The crop near the headlands was consequently poorer than in the main portion of the field. The cultivation as described by the cultivator was almost identical with that of first test. There was no indication of carelessness. The water in the well was sufficient, and the crop was irrigated four times a month, the more frequent watering being necessary on account of the light character of the soil. If full wages for manual and bullock labour are charged, and if the manure applied to the crop is valued at Rs. 3-0-0 per cart-load (its actual value if bought), then I fear that the cost of cultivation will probably about only equal the value of the crop. As already

explained in the first test, the labour was probably nearly all home labour, and the cultivator must have gained good wages for himself and family and ordinary hiring rates for his work cattle. The market rate for onions this year is higher than last year, but about equal to the average of the last five years. The outturn figures in this test are reduced by about 11 per cent to allow for dryage. The loss is, I believe, the greatest that could occur, because the onions after losing 11 per cent moisture are as dry as if they had been stored for months. The actual loss to cultivators by dryage is so variable that I considered the loss by dryage as shown by one sample could safely be applied to each test.

The survey number in which the third test (Exp. No. 81) was taken is in part classed as dry-crop and in part as *bágáyat*. The latter portion is irrigable from a well, also from a channel from a bunded stream. For this latter advantage it bears a special water-rate of Rs. 6, and for soil and water combined an assessment of Rs. 4-1-10 per acre. The test area, 3·5 gunthas, is less than the prescribed minimum. It contained an exact number of beds like the test areas of my other experiments, and was as large an area as the cultivator could harvest in a reasonable time with the labour at command.

The tested crop followed a rain crop of *bájri* which was reported poor owing to heavy rain at harvest time. In 1893-94 the field grew sugarcane, and in the previous year groundnut. This is a sequence of cropping which shows a due appreciation of the value of rotation. The tested crop was excellently cultivated, and the cultivator was well satisfied with the outturn. He would have watered the crop once more if the water in the well had not been low. Moreover, any water that remained was more urgently needed for sugarcane than for onions; therefore, the cultivator decided to lift the crop sooner than he otherwise would. The field has mixed black soil well suited for irrigated crops.

The following gives details of the cultivation, and its probable cost at ordinary rates:—

Area of Field—3,300 square yards.

	Rs.	a.	p.
Ploughing twice; 1st time with 10 bullocks for 2 days; 2nd time with 8 bullocks for 1½ days; bullocks Rs. 8; manual Re. 1-12-0	9	12	0
Clod-crushing by hand-implements, because field hard before ploughing and large clods turned up by plough.	1	0	0
Clod-crushing by heavy beam roller (*móng*) used twice to smooth surface	1	4	0
Manure applied and spread; 12 cart-loads (7 cart-loads bought at Rs. 3 per cart-load) manure Rs. 36; spreading Re. 0-6-0	36	6	0
Harrowing twice	1	14	0
Cost of preparing seed-bed, 480 square yards (⅒ of the above)	7	2	0
Cost of seed and sowing in October	3	14	0
Watering and weeding nursery seed-beds	3	8	0
Ridging with light plough	1	2	0
Transplanting in January; 4 bullocks, 1 man at the *mot*, 1 man distributing water, and 15 women transplanting for 2 days; bullocks Rs. 2; manual Rs. 4-12-0 ...	6	12	0
Weeding three times; 1st a month after planting, 2nd and 3rd at intervals of a fortnight; 15 women for 2 days for each weeding	11	4	0
Watering 12 times; 4 bullocks and 2 men for 1½ days each time; bullocks Rs. 18; manual Rs. 9 ...	27	0	0
Lifting, 85 women for 1 day	10	10	0
Total Rs. ...	121	8	0
Value of produce per Acre	228	0	7

	Rs.	a.	p.			
Cost of cultivation per Acre ...	178	3	2			
Assessment per Acre ...	4	1	10			
Total cost per Acre ...				182	5	0
Profit per Acre ...				45	11	7

Shola'pur.

Experiments on *bájri*, rice, gram, linseed and sesamum were directed to be made in this district. Two experiments on rice and gram each and one on linseed and groundnut have been reported. One of the rice tests and another on linseed have not been recorded for reasons given.

Mr. R. C. Brown, Assistant Collector,

Submits a rice test which is not satisfactory. The market rate at which the grain in husk is valued, 5 *sers* or 13 lbs. 18 *tolas* per rupee, is three or four times higher than it ought to be. Again the straw is valued at an exceedingly cheap rate, 1 anna for 134 bundles. The weight of a local *ser* of the grain is not reported. The calculations are based on a *ser* weighing 105 *tolas*; whereas the sample forwarded to my office weighed 109¼ *tolas*. The experimenter left his Sholápur charge before a reference was sent, and he was unable to make clear the points at issue. The experiment is not reported.

Mr. B. C. H. C. Kennedy, Assistant Collector,

Reports three experiments, one each on gram, linseed and groundnut.

The linseed test I cannot report. The acre averages are based upon a local *ser* of oilseed weighing 133½ *tolas*, whereas the sample sent to my office weighed only 123¾ *tolas*. The experimenter cannot explain the difference, but says "I am afraid the *javas* was not quite dry." There is a still greater difference between the reported weight of the sample *ser* of groundnut and the weight found in my office. The weights are respectively 129 and 117 *tolas*. These weights are for kernels. The outturn was measured and weighed in husk. The report shows that this was carefully done and I think the probability is that the reported weight of unhusked nuts is right, whilst that of kernels is wrong.

The groundnut test (No. 82) is in other respects not quite satisfactory. The outturn is poor for a well manured irrigated crop and this appears to be partly due to careless cultivation, the crop being badly overgrown with weeds. The field slopes gently to a *nála* and has mixed brown soil, assessed at Re. 1-7-11 per acre.. Thirty loads of farmyard manure per acre were applied for the groundnut. The preparatory tillage appears to have been careful. The seed was drilled in July and the crop harvested in February. The seed-rate, 106 lbs. per acre, is much over average. The season is described as unfavourable owing to deficiency of rainfall, particularly in October-November. But as the crop was regularly watered from a well the character of the season could not have affected the outturn very much. The experimenter says that the crop was 'harrowed up' and gathered. Probably a plough was used, but even with a plough many of the nuts are not at once exposed at the surface, and are not all gathered even when the field is gone over two or three times. Hand digging is the best method of lifting the crop and should certainly have been resorted to in the test area.

Mr. Kennedy on enquiry finds that the cash expenses incurred exceed the value of the crop, leaving out of count the labour of the Khátedár. This may be admitted. But if the crop had been an average one the results would have been different.

The outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn per Acre.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product (nuts in shell).	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 82	11	2,358	2,000	66 1 11	1 7 11	2·27

The field grew during the three previous years (1) maize, (2) onions, and (3) spelt wheat.

The gram tested (No. 83) by Mr. Kennedy gave a poor outturn. It was the sole crop of the year. *Jowári* is grown in two consecutive years and gram in the third year. The field has medium black soil assessed at Re. 1-0-11 per acre. No manure was applied and the cultivation was bad, the field being overgrown with weeds. Season was unfavourable and the outturn, though poor, is under-estimated at 8 annas. The gross value of outturn is only Rs. 6-9-4 per acre.

Mr. G. Scott, District Deputy Collector,

Reports a test on rice and another on gram.

The rice (Exp. No. 84) was grown on ordinary dry-crop soil, rain water being held by a *tál* newly constructed. The soil is blackish brown locally known as *marul*. The assessment is Re. 0-14-8 per acre. The rotation is reported as undefined. The experimenter ought to have given the sequence of crops during the previous three years as noted in Village Form No. III. The field was liberally manured with ordinary manure, 48 cart-loads per acre having been applied. The variety of rice grown was *sál*—a coarse early ripening variety. The season was average and the tillage good. The results are comparatively poor, but they are as good as could reasonably be expected; because the crop was drilled and the field is not properly embanked to hold water. An outturn of 760 lbs. of grain and 2,017 lbs. of straw, worth Rs. 19-15-6, classed the crop as a 12-anna one. But how the anna estimate is arrived at is not clear, as rice was apparently grown in the field for the first time.

This officer's gram test (No. 85) gave decidedly better results. It, however, only occupied 8 gunthas in a field measuring 8 acres 13 gunthas, most of which is classed as *bágáyat*. The gram occupied part of the *bágáyat* portion, the assessment of which is only Rs. 0-15-5 per acre. The field is irrigable from a well constructed before revision settlement. In the area tested wheat is usually a second crop after maize. This year gram was the sole crop. The other crops grown in the *bagáyat* portion this year were fodder *jowári* (*hundi*), maize, chillies and castors. The gram area was directly manured at the rate of 30 loads per acre of ordinary manure. Cultivation was good and season average. The experimenter says "the gram was irrigated only twice within one month. There was no necessity afterwards for irrigation, as there was sufficient rainfall." This statement can hardly be correct. The gram was sown in October, and it is most likely that it required the irrigation water as usual as it approached maturity. The seed was drilled. The seed-rate, 75 lbs. per acre, is decidedly high. The crop ripened in February and yielded 1,131 lbs. of pulse per acre, which at the cheap rate of 45¼ lbs. per rupee comes to Rs. 25. The value of the by-product is neglected. Gram chaff is all the same an excellent fodder. The percentage incidence is only 3·85.

Sa'ta'ra.

Messrs. Rand and Arthur carried out three tests each, and Mr. Cursetji two. The last named officer explains that he could not do the *bájri* test required of him as he was at the time engaged on special duty.

Mr. W. C. Rand, Assistant Collector,

Reports two tests on gram and one on spelt wheat. All were second crops.

The gram fields (Exp. Nos. 86 and 87) have each black soil and are respectively assessed at Rs. 3-1-2 and Rs. 3-8-0 per acre. Each field grows *bájr* and *shálu jowári* in alternate years, the *bájri* being invariably followed by gram No second crop is taken after *shálu jowári* as it is itself practically a late crop and belongs as much to the rabi as to the kharif season. The monsoon rainfall was deficient and the gram crops naturally suffered. The *bájri* crop in each field was lightly manured, but no manure was applied directly for the gram. The seed-rates, namely 83 and 103 lbs. per acre, are much over average. The experimenter was aware of this, but had to accept the statements of the cultivators.

The outturns, &c., are as under :—

	Anna Estimate.	Outturn of Pulse per Acre.	Value of Outturn per Acre.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 86)...	14	264	7 6 3	3 1 2	41·57
Second do. (Exp. No. 87)...	15	392	11 4 10	3 8 0	30·97

The value of by-product is neglected. The reported seed-rates are respectively about $\frac{1}{5}$ and $\frac{1}{4}$ the outturn.

If these figures are correct, and if the cost of tillage be added to the cost of seed, I doubt if the gross value of outturn in the first test will do much more than meet expenses. As regards the second field, it is clear from the experimenter's report that in an ordinary year the burden of assessment is not too heavy. The area experimented upon is Inám land. The Inámdár has let two acres to a tenant of long standing, who pays at the rate of Rs. 5-5-0 per acre, the Government assessment being Rs. 3-8-0. The tenant is a woman. This year the land was let by the tenant to a yearly sub-tenant. The terms were—the tenant to provide $\frac{3}{4}$ manure, $\frac{3}{4}$ seed, $\frac{3}{4}$ hired labour, and take $\frac{3}{4}$ gross produce. Sub-tenant to provide work cattle and tools and implements, and pay for $\frac{1}{4}$ seed, $\frac{1}{4}$ manure and $\frac{1}{4}$ hired labour, and take $\frac{1}{4}$ gross produce.

Khapli wheat (Exp. No. 88) was the subject of the third test. There were not many fields to select from as some were reaped and some were not ripe. The experimenter believes that the tested crop was rather above the average of the village. The reported seed-rate, *viz.* 170 lbs. per acre, is very high. The occupants are of the Máli caste. The number is partly classed as *bágáyat* and partly as *jirdyat*, and is irrigable from a *pát* which is not always to be depended upon. The water failed in 1892-93, and spelt wheat which had been sown had to be ploughed up and gram sown instead. The experimenter finds that the *jirdyat* as well as the *bágáyat* portion of the number grows garden crops, and he is making enquiries as to how the apparent mistake in classification came to be made. The assessment, soil and water combined, on the whole number, is Rs. 8-4-0 per acre, whilst if the water-rate be charged against the *bágáyat* portion only, the acre rate is Rs. 10-13-11. The soil is blackish and locally called *kálvat*. The season was favourable, and *khapli* crops were quite up to the average of former years. No manure was applied directly, but the tested crop must have got some benefit from an application of $18\frac{2}{3}$ loads of ordinary manure per acre applied to the previous *bájri* crop. The principal kharif crops grown during the last three years were *rála* and maize mixed in 1892, groundnut in 1893, and *bájri* in 1894. In 1892 and 1894 there were second crops and also small areas under pepper and turmeric in the former year and under plantains, turmeric and onions in the latter year. The tested crop was sown by heavy drill at the end of October and reaped early in March.

The outturn results are as under :—

	Anna Estimate.	Outturn of Grain per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 88	20	929	30 15 3	10 13 11	35·71

The by-products were neither weighed nor valued, and although the straw of spelt wheat is not used as fodder, it has some value, which if added would

somewhat enhance the gross value of outturn. Mr. Rand says "the assessment appears to me to be very high in proportion to the value of the outturn." He thinks that the *bájri* grown in the monsoon "was probably of considerably less value than the crop of *khapli*, and when full allowance is made for it the incidence of assessment is still heavy."

Mr. S. R. Arthur, Assistant Collector,

Submits one test each on *bájri*, rice and *nágli*.

The *bájri* crop (Exp. No. 89) was grown on light soil, *mál rán*, assessed at Re. 0-7-8 per acre. On the area tested, *bájri* and *argad jowári* are taken in alternate years. The field, however, grows other crops. This year *bájri*, *jowári*, *nágli* and *sáva* each occupied different areas, and about $\frac{1}{7}$th of the whole number lay waste for grass. The arable portion of the field is ploughed every year. It was twice ploughed for the *bájri* and manured by folding sheep. The harrow was worked several times during May and June. The seed was drilled at the end of June, and the crop ripened in November. Meantime it was twice weeded, probably with the bullock hoe. The tillage was decidedly careful, and the season is reported good. The outturn is only middling. The crop is classed as a 12-anna one. The yield is 299 lbs. grain and 452 lbs. by-product, together worth Rs. 11-6-6 per acre. The incidence works out 4·20 per cent.

The rice crop tested (Exp. No. 90) by this officer gave a poor outturn. This may fairly be attributed to the soil being salt, to the want of timely rain and to the crop being grown from drilled seed.

The field is assessed at Rs. 2-13-8 per acre and grows rice every year, and a second crop of gram in seasons of favourable late rainfall. The field was manured with about 11 cart-loads cowdung per acre. The manure is reported worth Rs. 2 a cart-load. This valuation for an out-district appears exceedingly high, and particularly so as the reported value of the manure exceeds the gross value of the crop. If the manure is valued at the ordinary market price, then the cultivator must have expected a much better outturn from the field than he got. The inference, therefore, is that the manure is valued far too high, or the anna estimate of the crop is much too high. There is probably considerable error in both estimates.

The reported seed-rate, 31 lbs. per acre, is much under average for a drilled crop. The seed was sown in June and the crop harvested in November.

The outturn, &c., results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn per Acre.	Assessment per Acre.	Percentage Incidence of Assessment.
		Grain.	Straw.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 90.	14	524	1,223	17 .0 6	2 13 8	16·75

Nágli (Exp. No. 91) yielded well on light reddish soil. The crop was grown from transplanted seedlings. The field and seed-bed were manured with ordinary manure at the rate of approximately five carts per acre. Again the manure is valued at Rs. 2 per cart-load. Season and tillage are each described as good. The number extends to 4 acres 9 gunthas, of which 25 gunthas was in *nágli*, 2 gunthas in rice and the remainder apparently lay fallow for grass. The experimenter reports that the area under *nagli* grows *nágli* every year. The field was well ploughed before the rains, and after rain fell, was well prepared with the plough and the harrow. The seed-rate works out 27 lbs. per acre. This is an extravagantly high rate, and probably 4 or 5 times as much as was needed.

The outturn, &c., results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn per Acre.	Assessment per Acre.	Percentage Incidence of Assessment.
		Grain.	Straw.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 91.	12	1,513	2,653	32 8 3	0 9 6	1·80

If the area under *nágli* is not allowed, periods of fallow, as is usual, it has probably better description of soil than the rest of the number. I think that there is no doubt that the anna estimate is not high enough. The by-product is valued at over Rs. 6 per acre, and as *nágli* straw is very poor fodder, probably the gross value of outturn is thus enhanced more than it should be.

Mr. J. M. Cursetji, District Deputy Collector,

Submits two tests, one each on wheat and gram, which were well conducted and fully reported.

The first test (Exp. No. 92) is on dry-crop wheat grown on medium black soil, assessed at Re. 1-9-4 per acre. The soil cracks freely in the fair season. No manure is ever applied. Only rabi crops have been grown since 1890. Generally wheat and gram, each with a sprinkling of safflower, are grown on separate areas each year. Linseed took the place of gram one year, and in 1892 the field was wholly under wheat. The season for the tested crop was fair, the late rains being favourable. The field is ploughed every second year. The heavy harrow only was used this year. The crop was not weeded.

Thirty-three pounds per acre of seed drilled in September-October produced a 16-anna crop, which yielded 381 lbs. grain and 337 lbs. straw. The grain is valued at Rs. 11-10-6 per acre, but the value of the straw is neglected. The incidence of assessment works out 13·58 per cent. The full assessment is Rs. 17, but the Inámdár pays *judi* to the extent of Rs. 3. The land is rented to a tenant on the following conditions; tenant gives half the gross produce and meets all expenses except ½ cost of seed and sowing and ½ cost of reaping, winowing and threshing.

This officer's report on his gram test (No. 93) furnishes information of interest. The field was wholly *jiráyat* until the introduction of the revision survey. A year afterwards the occupant dug a *budki* (a *kaccha* well by the bank of a *nála*), and began to grow garden crops. The whole number extends to 13 acres 1 guntha.

In 1891 the crops were entirely *jiráyat*.

In 1892-93, with the assistance of irrigation, one acre groundnut was grown.

In 1893-94 the garden crops were—

	A.	g.
Turmeric	0	5
Plantains	0	5
Sugarcane	0	20
Groundnut	1	0
Total ...	1	30

In 1894-95 the garden crops were—

	A.	g.
Sugarcane	2	0
Chillies	0	20
Turmeric	0	20
Groundnut	1	0
Plantains	0	1
Total ...	4	1

How far the cultivation of garden crops in this holding will extend wil depend upon whether the occupant can command a sufficient supply of manure of water, and of labour. The soil is medium black, apparently suited for irriga tion. The assessment is Re. 1-11-0 per acre. The gram gave only a middling outturn. The season was unfavourable, rain being scanty when most wanted. This statement hardly tallies with the character of the season as described for the wheat test in the same táluka. The cultivation is described as indifferent. No manure was applied. It was probably all needed for irrigated crops. The principal dry-crops grown in the field are *jowári*, wheat and gram. Double crops are not taken. The gram, which is estimated as an 11-anna crop, yielded 241 lbs. pulse and 256 lbs. useful by-product per acre, the gross value of which is Rs. 6-12-11. The incidence is 24·77 which looks high, but is apparently due to a poor crop.

SOUTHERN DIVISION.

Belgaum.

Each Assistant Collector was asked, as last year, to take two tests on *jowâri* and one on *bájri*. Mr. Boyd followed the settled programme. Mr. Swifte sent in one test on *jowâri* and another on wheat. Mr. Deshpánde was engaged on special duty during *bájri* harvest. He has submitted 5 valuable experiments on *jowâri*.

Mr. Lushington, Superintendent, Land Records and Agriculture, failed to carry out any experiments owing partly to exigencies of tour and partly to heavy settlement duties.

Mr. C. C. Boyd, Assistant Collector,

Submits three tests, one on *bájri* and two on *jowâri*. The Collector says "the incidence of assessment is advisedly pitched very low in these parts where the soil is poor and the rainfall fitful and uncertain. Only a good crop is harvested once in about 3 or 4 years. When the season is favourable the incidence is light, and when bad it becomes unduly heavy. The true incidence is obtained by striking the average of a series of years."

The *bájri* tested (Exp. No. 94) by Mr. Boyd grew on hard, red stony soil which grows *jowâri* and *bájri* in alternate years. The assessment is Re. 0-2-1 per acre. The season was very fair: better in this and the surrounding villages than in the rest of the district. The field was lightly manured. It gets some manure every second year.

Jowâri (Exp. No. 95) on similarly classed soil in the same village and bearing the same assessment yielded better than the *bájri*. The field was more liberally manured. Other conditions were much the same.

The respective outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
		Principal Product.	By-product.				
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
Experiment No. 94.	15	454	555	12 8 11	0 2 1	1·03	*Bájri.*
Experiment No. 95.	18	664	810	19 14 ·5	0 2 1	0·65	*Jowâri.*

The results of Mr. Boyd's 2nd *jowâri* test (No. 96) show a striking contrast to the remarkable lightness of incidence as shown in the above figures. The experiment was conducted on rich deep black soil which is never manured, because (*a*) manure is scarce, and (*b*) the land bears good crops without it in favourable years. Mr. Boyd says the season was bad. Rain was scant at seed time, also in October when generally expected. "A very bad year in this part of the country, no good crops except in gardens." The field grows *jowâri* continuously, kharif *jowâri* one year, rabi *jowâri* the next. The seed for the tested crop was drilled in September and harvest took place in January.

The results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a p.	Rs. a. p.	
Experiment No. 96 ...	5	126	590	8 3 6	1 4 9	15·77

The straw and chaff are valued at 110 lbs. and 256 lbs. per rupee—rates which could only rule in years of scarcity.

Mr. L. C. Swifte, Assistant Collector,

Submits a test on wheat and another on *jowári*. The latter I cannot report. The acre averages are based upon a *ser* of grain weighing 80 *tolas*, whereas the weight found in my office was 64½ *tolas* only. On reference the experimenter says the sample was carefully kept in his office box from the 14th December to the 21st February, and attributes the difference to dryage. No grain, if ripe when reaped, could lose weight to the above extent, and the difference is certainly due to some other cause than dryage.

The wheat experiment (No. 97) was conducted on a black soil field which grows wheat, cotton and *jowári* in rotation. The season was somewhat unfavourable, and the crop suffered from want of moisture, also, it is reported, from the effect of west winds. The experimenter cannot see how a west wind could damage the crop any more than any other wind, and most people would be of the same mind. If clouds accompanied the west wind they certainly would be harmful. The tillage is described as good. The field was lightly manured with ordinary manure, 3 carts per acre. The wheat had subordinate rows of safflower which was not tested. The seed was drilled in October, and the wheat reaped towards the end of January. The seed-rate, 25 lbs. wheat and 2 lbs. safflower per acre, is somewhat under average.

Neglecting the safflower outturn (the crop occupied ⅛ of the whole area) and presuming that the wheat occupied the whole area, the outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.		Rs. a. p.	Rs. a. p.	
Experiment No. 97 ...	12	425	4 bundles	12 9 7	1 12 8	14·22

Mr. N. G. Deshpánde, District Deputy Collector,

This experimenter has taken two tests in each of two fields and a single test in a third field, all on *jowári*. The test areas have been selected with discrimination and as the results are obviously intended to show the effect upon the outturns of good rotation and manure, I will treat the tests taken in three separate numbers as five distinct experiments. They would have been of much greater value if the tested crops had not subordinate mixtures. The mixtures varied between fields, and none were tested. The subordinate crops may have been of considerably more value in one field or one portion of a field than in another. The seed-rates vary considerably, and this is another factor which vitiates strict comparison. The *jowári* seed-rate varies from 4 lbs. in the 3rd test to 25 lbs. in the 5th. The Collector says. "The experiments seem to have been carefully conducted and if the results can even be approximately trusted, the burden of assessment must be considered a very light one to bear."

The first two tests (Nos. 98 and 99) were taken on black soil, the third and fourth (Exp. Nos. 100 and 101) on good red soil mixed with small stones, and the fifth (Exp. No. 102) on *mardi* land, *i. e.*, a thin layer of black or red soil overlying *murum*. Season was favourable and tillage good throughout.

In the first field the areas selected for test belonged to two different occupants, grew different crops last year, and were this year sown at different seed-rates with different varieties of *jowári* and were otherwise differently treated.

The results from the various tests are as under :—

	Seed-rate per Acre.	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
			Principal Product.	By-product.				
	Sers.	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 98) ...	3½ (*Jowdri*). 3½ (*Tur*).	20	1,316	4,024	44 15 11	1 15 3	4·34	*Khab-Shedgár* variety of *jowdri* sown. Every sixth row mixed *jowári* and *tur*. Field manured with six loads manure and by folding sheep. Previous crop cotton.
Do. (Exp. No. 99) ...	6 (*Jowdri*). 6 (*Tur*).	20	1,486	3,092	47 9 6	1 15 3	4·10	*Gidgidgemp* variety of *jowári* sown. Every fourth row mixed *jowdri* and *tur*. Field manured with 16 cart-loads manure. Previous crop chillies which was heavily manured.
Second field (Exp. No. 100).	2 (*Jowdri*). 1 (*Kulthi*).	20	556	796	19 1 10	0 13 1	4·7	Variety of *jowdri Gund*. Every 4th row mixed *jowdri* and *kulthi*. Field manured with 4 loads manure per acre. Previous crop *jowdri*.
Do. (Exp. No. 101).	4 (*Jowdri*) ½ (*Tur*).	20	819	1,072	26 12 9	0 13 1	3·05	Variety of *jowdri Shedgár*. *Jowári* and *tur* were mixed together before sowing. No manure this year but last year well manured for chillies.
Third field (Exp. No. 102).	12 (*Jowdri*). 6 (*Tur*). 5 (*Kulthi*).	20	244	588	9 1 7	0 8 3	5·66	Variety of *jowdri Gund*. Every fourth row sown mixed with *tur* and *kulthi*. No manure applied this year or last. Previous crop *rála* and *bájri* mixed. Seed-rate much higher than necessary.

The results tabulated above clearly indicate the value of good rotation and unmistakably show the value of manure. They also show that *jowári* does not do so well after a cereal as after crops of another family and that it does better after chillies than after cotton, the probable reason being that chillies to succeed must be liberally manured and leave a residue in the soil. If we leave out of count the seed rate of the last test, which is certainly higher than it ought to be, the other tests show that the better the condition of the field the higher the seed-rate allowed. The seed-rate may vary with the kinds grown.

Mr. Deshpánde gives the following interesting account of the different varieties tested : "*Gund* (meaning round stone) is small round hard grain. It grows on inferior soils and does not require much moisture. *Shedgár* is a better kind of grain. It grows on good soft soils but does not require so much care and manure as *Gidgidgemp*. *Khab-shedgár* is a variety which differs from *Shedgár* in that the plant grows tall and straight, and contains more saccharine matter and is eaten by children like sugarcane. This particular quality gives it the distinguishing prefix *khab* which means sugarcane. *Gidgidgemp* is a plant of stunted growth but has a large grain which yields good soft flour. This variety is unsuited for inferior kinds of soil and yields larger quantities of grain than other varieties, and the grain is sold dearer than other varieties. *Gund* is always the cheapest variety." Mr. Deshpánde, however, values all varieties at the same rate in his tabulated statement of results.

Bijapur.

Only four experiments have been reported from this district. Mr. Page sent in only one test on *bájri*. Subsequently he was absent on duty with a survey party. Mr. Chuckerbutty submitted no experiments because he was unable to find in his charge a *bájri* field without mixtures and the results of one test he did were open to the same objections that were raised against his experiment last year. The Collector thinks this explanation hardly satisfactory. Mr. Artál conducted 3 tests required of him.

Mr. H. Page, Assistant Collector,

Submits one test (No. 103) on *bájri*. The *bájri* was a mixed crop, and every fifth row was sown alternately with *kulthi* and *tur*. The *bajri* thus occupied ⅘ of the whole area; but as the subordinate crops were not tested the *bájri* acre averages are worked out assuming that this crop alone occupied the whole of the test area. It is not reported whether the subordinate crops promised to yield well or otherwise. The test is only of value as showing that the outturn from the principal crop alone in a moderate season is sufficient to make the burden of assessment very light. The field has black soil and grows chiefly *jowári*, either late or early, and occasionally *bajri*. The tested crop was manured with approximately 3 loads of ordinary manure per acre. The tillage is described as good. The seed, about 4 lbs. per acre, was sown in July and the crop harvested in November.

Outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 103 ...	8	331	436	6 12 4	0 3 1	2·84

Mr. R. C. Artál, District Deputy Collector,

Submits two tests on *bájri* and one on *jowári*.

The *bájri* tests (Nos. 104 and 105) were taken on light soil fields assessed respectively at Re. 0-2-0 and Re. 0-7-4 per acre. No manure is ever applied to either field; a considerable proportion of the first field usually lies waste for grass but occasionally the portion is brought under tillage. Only a small portion of the second field usually lies waste. In both fields the principal crops are late *jowári* and *bájri*, each with subordinate mixtures. Generally a small area in each field grows chillies. Sesamum in the first field and Italian millet and tobacco in the second field are now and then grown to a small extent.

The tested crop in the first field had a mixture of *math* in every 6th row, while in the second field *tur* was similarly sown. In the latter there was an additional sprinkling of *mug* and *ambádi*. The subordinate mixtures are estimated in each field to have covered $\frac{1}{11}$-th of the areas experimented upon, but they were not tested. It is not reported whether they promised to yield well or otherwise. The acre averages are calculated assuming that *bájri* alone occupied the test areas.

The first field was not ploughed but was well prepared with the harrow and the crop was bullock-hoed thrice. The second field was twice ploughed and well prepared with the harrow before sowing. Subsequently the crop was twice bullock-hoed and once hand-weeded. Sowing was later than usual owing to scant early rainfall. After sowing rain was sufficient and timely, and the season was good. The reported seed-rates are in each field the same, *viz.* 4½ lbs. per acre. The fields were sown towards the end of July and the crops ripened in the middle of November.

Outturn, &c., results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 104 ...	16	426	996	9 7 3	0 2 0	1·32
Experiment No. 105 ...	16	519	1,081	11 7 9	0 7 4	3·99

The burden of assessment is decidedly low.

The *jowári* tested (No. 106) by this officer grew on a black soil field which is assessed at Re. 0-15-3 per acre. The principal crops grown are cotton, late *jowári*, wheat and linseed, and these are more or less rotated with each other. Generally safflower is a subordinate crop with *jowári*, but this year the *jowari* was sown alone. The season was fairly good. Late rains were rather scant and as the crop was sown in September and reaped in February it suffered to some extent from lack of moisture. Manure was last given four years ago. About 6 cart-loads per acre were then applied. The preparatory tillage for the tested crop was only fair. The harrow only was used, and although the bullock hoe was worked four times to keep down weeds yet the whole area was covered with *harikli* grass. The reported seed-rate, *viz.* 3½ lbs. per acre, is under average.

Outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 106 ...	14	681	1,701	15 8 0	0 15 3	6·14

Dharwar.

Experiments on sesamum, *bájri*, *ragi*, linseed and gram were arranged for in this district. Mr. Knight sent in one test on *rági* and another on safflower. He had arranged for a linseed test, but owing to short rainfall the crop was harvested earlier than usual and on his arrival he found safflower the only standing crop in the locality and so chose it. Mr. Anderson could not find a *bájri* field in his charge suitable for test. He therefore experimented on *navani*. Later on he went on duty with a survey party. Mr. Bhángáonkar submitted tests on *ragi*, gram and linseed.

Mr. Swifte's experiment on *ragi* which was received too late for inclusion in last year's report has been reviewed in the present report.

Mr. R. Knight, Assistant Collector,

Submits one test each on *nágli* and safflower.

The *nagli* (Exp. No. 107) had subordinate to it *tur* which occupied every ninth row. The *tur* was not tested. The crop selected for experiment was over average for the district. It is assessed at 12 annas, whilst the experimenter reports that the average for such crops in the neighbourhood was only 6 to 8 annas. The season was unfavourable owing to inadequate rainfall. No manure was applied since 1892, and then the dressing applied was very light. The field has red *masari* soil. There is no definite rotation. *Jowari* occupied the whole field in 1893, and *nagli*, *sava*, *tur* and *kulthi* were the crops taken in 1894. In the latter year one-fourth of the field lay waste. Irrespective of the *tur* the tested crop yielded 966 lbs. grain and 935 lbs. by-product per acre, together worth Rs. 13-13-0. This for a drilled crop in an unfavourable year must be considered a satisfactory outturn. The percentage incidence is only 6·68.

This officer's test on safflower is of no value and is not reported. The safflower was a row crop with wheat and only occupied every ninth row. The anna estimate is 4 annas. The season was very poor for safflower. The actual outturn from an acre was only 31 lbs. worth Re. 0-11-10, the yield of wheat being an unknown quantity.

Mr. L. C. Swifte, Assistant Collector.

This officer's test on *nagli* (Exp. No. 108) was submitted too late to be included in last year's report. The *nagli* had *jowari* subordinate to it. The latter crop was not tested. It occupied every fifth row. The acre averages are calculated on the assumption that *nagli* occupied the whole of the test area.

The field has red *masari* land assessed at Re. 0-12-5 per acre. A fairly liberal dressing of ordinary manure, 12 loads per acre, was applied. Season and tillage were both good. The crop yielded well and is under-estimated, I think, at 10 annas.

The outturn, &c., results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 108 ...	10	815	1,474	13 12 0	0 12 5	5·64

Mr. F. G. H. Anderson, Assistant Collector,

Submits one test (No. 109) on Italian millet. This crop was more extensively cultivated than usual owing to the rainfall being scant and not well distributed. A season of light rainfall suits *navani* better than *jowâri*. The former crop is of rapid habit of growth. It may be sown with advantage late if early rains are scant. On the other hand if sown early it gives a supply of fodder and grain sooner than almost any other grain crop. The field selected for experiment occupies a slope and has good red soil. The experimenter saw better *navani* crops on similar land, but generally the crops on black soil were not so good. The field was fairly manured, about 9 loads per acre of ordinary manure being applied. The seed was drilled in August at the rate of 6½ lbs. per acre through a single tube fixed behind a plough and was thus dropped into every furrow made by the plough and covered by the soil moved in making the next furrow. The crop ripened in 3½ months and yielded 843 lbs. grain and 2,631 lbs. of by-product worth together Rs. 11-13-0 per acre. Both principal and by-products are valued at a cheap rate; the former being valued at 79⅔ and the latter at over 2,000 lbs. per rupee. In a year of scarcity both grain and by-product would have a considerably higher value for home consumption. The field grows *jowâri* with subordinate mixtures, cotton and *navani*, but no definite rotation is practised. The crop grown depends upon the character of the season. The field is assessed at Re. 0-8-8 per acre and the incidence works out 4·58 per cent. The field under experiment had been the year before hand-dug at a reported cost of Rs. 20-6-0 per acre to clear it of the *nattu* weeds. The benefit is presumed to last 10 to 14 years. There is considerable doubt as to the accuracy of the reported figures. The sample forwarded to my office weighed 146 *tolas* against a reported weight of 170 *tolas*. The experimenter on reference says that the 24 *tolas* may have been lost during transit or eaten by vermin. He further says the results are not affected, as his calculations are based on measured quantities and not on weights: but if the grain was not properly dry when measured, the measured quantities must be necessarily wrong. I report the test with some misgiving.

Mr. K. N. Bhângaonkar, District Deputy Collector,

Submits three tests, one each on *nâgli*, gram and linseed.

The *nâgli* experiment (No. 110) was conducted on white *masâri* soil which bears an assessment of Re. 0-12-10 per acre and grows *jawâri* and *nâgli* in alternate years. A portion of the field is manured with about 15 loads per acre of ordinary manure every year. The manuring of the whole field is completed in five years. The portion under experiment was last manured in 1893-94. The *nâgli* was a drilled crop, the seed-rate being about 3 lbs. per acre. This could hardly have been sufficient. The seed was drilled towards the end of June and the crop ripened early in December. The season was unfavourable because there was a long break in the rains between August and the 15th of October. Tillage is described as good.

The outturn results are as under:—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 110 ...	10	1,023	181	19 4 11	0 12 10	4·15

The by-product was not weighed, but it was valued at Rs. 3-12-0 per acre.

The gram tested (No. 111) by this officer had subordinate rows of safflower. The latter crop occupied $\frac{1}{7}$th of the area under experiment. It was, however, not tested. The acre averages are deduced on the assumption that gram alone occupied the test area. The field has black soil, which grows mostly cotton, wheat, *jowári* and gram. Manure was sparingly applied for the gram, less than 2 loads per acre being used. The rainfall was unseasonable and insufficient. The crop estimated at 8 annas yielded 242 lbs. pulse and 143 lbs. chaff per acre, together worth Rs. 7-10-7. The incidence of assessment works out 20·73 per cent.

Linseed was tested also on deep black soil which grows usually cotton, *jowári*, wheat, gram and linseed, rotated with each other but in no definite manner. The linseed was a subordinate crop, there being one row of linseed and one row of gram to 6 rows of *jowári*. Neither the gram nor the *jowári* were tested, and the actual outturn of linseed from an acre was 46½ lbs. worth Rs. 2-5-1. It might be argued that if the linseed occupied the whole of the field, its acre outturn would be eight times the above figure. But it would be very unsafe to gauge the burden of assessment by such data. The results are not included in the tabulated statement of results, because either set of figures would be entirely misleading.

Kolába.

Eight experiments in all have been reported by District Officers. Mr. Fawcett sent in three tests, and Mr. Brooke two on rabi pulses. Mr. Kánga could not do *rági* and *vari* tests, owing to *jamábandi* and other work, and so did all the three tests on gram.

Officers of the Konkan Revenue Survey carried out 6 experiments, all on rice in this district.

Mr. C. G. H. Fawcett, Assistant Collector,

Submits one test each on *nágli*, *vari* and niger seed. The test areas are in each case half of the prescribed minimum. The experimenter explains that he had no copy of the standing orders with him, hence the mistake made.

The *nágli* and *vari* tests (Nos. 112 and 113) were taken on the same *varkas* number. The crops were grown by different cultivators, who rent the patches under cultivation from the Bráhman owner at a rent of ⅓rd the gross produce in kind. The area of each test grows after two years' fallow *nágli* in the first year and *vari* in the second. Then the land is again allowed to lie waste. Excluding *pot kharab* the area of the whole number is 3 acres and 29 gunthas. The assessment is Re. 1 for the number or Re. 0-4-3 per acre. *Nagli* in several patches occupies 17 gunthas and *vari* 9$\frac{2}{8}$ gunthas. The rest is in grass. The experimenter values the grass at Rs. 12, and says, if it was exported to Bombay, it would be probably worth more; the field being near the railway and not subject to trespass by cattle. The grass is used as ráb material for the seed-beds of 6 acres of paddy fields and for this purpose is worth Rs. 12. Assuming that the other cultivated patches in the number yielded the same as the test areas of *nágli* and *vari*—

	Rs.	a.	p.
The Bráhman's rent from the tenants would be	5	1	0
Add—Value of grass	12	0	0
	17	1	0
Deduct—Assessment	1	0	0
Net profit this year	16	1	0

The patches of the number which are under cultivation have stony sloping shallow soil. Both *nágli* and *vari* were grown from transplanted seedlings. The seedlings were in each case grown on liberally rábed seed-beds. The ráb material used consisted of cowdung, earth and grass. The *nágli* required $5\frac{15}{17}$ gunthas seed-bed to an acre of transplantation, whilst *vari* required for a similar area a $2\frac{3}{15}$ gunthas seed-bed. The reported seed-rates are in each case far too high and cannot be accepted as at all accurate. The cultivation of both crops is described as indifferent, but in what respects is not clear. It might, I think, be more correctly described as ordinary. The season was good. The rainfall was sufficient and timely during the growing season; but when the crop was ready for harvest heavy rain lodged the crops and did some damage. The *nágli* was a first crop after fallow, the *vari* the second crop, *nágli* preceding it.

The outturn results are as under :—

	Anna Estimate.	Outturn of Grain per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 112 ...	16—18	1,384	26 12 4	0 4 3	0·99
Do. No. 113 ...	16—18	974	15 9 2	0 4 3	1·70

The value of by-products is neglected in both tests. The straw and chaff of both *nágli* and *vari*, though comparatively worthless as fodder, ought to have a considerable value as ráb material, more particularly as the grass from the same holding is valued at a high rate for ráb purposes.

Niger seed (Exp. No. 114) on less stony *varkas* land assessed at Re. 0-5-4 per acre did not yield so well. The niger seed was the second crop taken since the land lay waste, *nágli* being the previous crop. Two years fallow alternates with two years of cropping. No manure was applied. The seed was broadcasted about the middle of June. The seed-rate is, I think, considerably overestimated at $13\frac{1}{2}$ lbs. per acre. The whole number measures 30 gunthas, of which 8 gunthas only are under tillage, the rest under grass. The cultivated patch is let to a tenant. The owner gets $\frac{1}{3}$ of the gross produce. The portion under grass is reported to be worth to the owner only about 12 annas as the number is near a road, and the grass is trampled down and eaten by trespassing cattle.

Outturn results are as under :—

	Anna Estimate.	Outturn of Grain per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 114 ...	16—18	204	9 6 0	0 5 4	3·55

Mr. H. O. W. G. Brooke, Assistant Collector,

Reports two tests, one on gram, the other on *val*, both second crops in rice fields. The outturn results are in each case quite satisfactory, and are, I think, under-estimated at 12 annas each.

The gram field (Exp No. 115) came into the present occupant's possession three years ago when he embanked it; and gram presumably as a second crop after rice has been grown each year since. The *val* field (Exp. No. 116) is owned by a tradesman and rented to a tenant-at-will for one-third gross produce as rent. The field grows rice every year and second crop in season of favourable late rainfall. The season for *val* was exceptionally good, but the gram was slightly damaged by late rain. The tillage of each field was ordinary. The seed in each case was sown broadcast after ploughing. The reported seed-

rates are for gram 70 to 80 lbs. per acre and for *val* 24 lbs. The former is over average, but a broadcasted crop needs more seed than a drilled crop. Neither crop was manured.

Outturn, &c., results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
		Principal Product.	By-product.				
	As.	Lbs.	Lbs.	Rs. a. p	Rs. a p.		
Experiment No. 115 ...	12	827	... ..	27 13 0	4 1 5	17·62	Gram.
Do. No. 116 ...	12	933	20 Baskets.	20 12 0	6 6 5	30·85	*Val.*

Mr. R. E. Kanga, District Deputy Collector,

Submits three tests (Nos. 117—119) on gram conducted on *rabi* fields, which are assessed respectively at Re. 0-15-3, Re. 0-13-5 and 14 annas per acre. The field bearing the least assessment was well manured by folding sheep. The others were not manured. The Collector in the forwarding letter notes that the manured field produced nearly 50 to 90 per cent more pulse than the two higher assessed unmanured fields. He adds : "Apparently with ordinary unmanured cultivation the assessment on an average crop is about $\frac{1}{10}$th of the crop ; with liberal sowing and good manuring the assessment can be reduced to about $\frac{1}{17}$th." The first field grows gram every year. *Val* and gram are rotated in the second field, and *mug* and gram in the third. The season was good. The cultivation of the third field is described as fair, that of the others good. The seed was sown through a single tube fixed behind a plough. The seed thus falling into the furrow made by that implement and covered by soil moved in making the next furrow. The seed-rate would vary with the tilth of the field, more seed being required if the soil is rough than if friable and smooth. The reported seed-rates are respectively 80, 157 and 117 lbs. per acre. All are above average and the two last much above.

The outturn results are as under :—

	Anna Estimate.	Outturn of Pulse per Acre.	Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
	As.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 117) ...	12	267	9 4 7	0 15 3	10·26
Second do. (Exp. No. 118) ...	16	397	13 9 1	0 13 5	6·18
Third do. (Exp. No. 119) ...	10	210	7 2 3	0 14 0	12·25

Mr. W. S. Cole, Assistant Settlement Officer, Konkan Revenue Survey,

Submits three tests on rice. The test areas are each only 2 gunthas or half the prescribed minimum. The experimenter says he had no copy of standing orders with him, hence this mistake. The crops were in each case grown from transplanted seedlings raised on rábed seed-beds. No manure was used on the fields. The local information as to proportionate area of seed-bed to acre of transplantation and as to seed-rates was too conflicting and unreliable to record. The average seed-rate of the district for rice is reported as 20 to 30 lbs. per acre. A different variety of rice grew on each field : *Panvel* worth Rs. 26 per *khandi* of 20 maunds in the first field, *Ghosal* worth Rs. 28 per *khandi* in the second, and *Hartál* worth Rs. 25 per *khandi* in the third. The tillage of the second field is described as fair, that of the others good. Season was favourable. Each field grows rice every year, and no second crops are taken.

Outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 120)	18	1,593	2,260	32 3 0	3 2 2	9·71
Second ,, (Exp. No. 121)	18	2,100	5,420	49 9 4	3 12 9	7·67
Third ,, (Exp. No. 122)	18	1,890	3,880	33 10 4	4 1 1	10·84

Mr. W. D. Wilkins, Assistant Superintendent, Konkan Revenue Survey,

This experimenter cut two patches from the same field and presents the results as two different tests. The results are reported as two distinct experiments, because one of the test areas was selected in the seed-bed which had been rábed and which when the seedlings were removed, was itself transplanted. The other test area was selected in the main portion of the field. The field was not manured, and Mr. Wilkins took no notes as to the method in which the seed-bed was rábed. The test is of interest as showing that rábing not only benefits the seedlings grown on the seed-bed but also leaves a manurial residue which benefits the crop subsequently grown from transplanted seedlings on the seed-bed. This is generally known to the rayats. The outturn from the seed-bed is usually more than from the rest of the field. Grain from the seed-bed is also usually superior in quality and is retained as seed for the following year. The season was somewhat unfavourable, and the tillage is described as good.

Outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.	Remarks.
		Principal Product.	By-product.				
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
Experiment No. 123 ...	14	2,147	2,256	47 13 10	7 13 6	16·38	Seed-bed area.
Do. No. 124 ...	14	1,437	1,500	32 4 8	7 13 6	24·29	Field area.

The mean of these results cannot be taken as average for the field, because the seed-bed only was about $\frac{1}{6}$th of the field.

Mr. J. A. McIver, Assistant Superintendent, Konkan Revenue Survey,

Submits one rice test. The field (Exp. No. 125) was cultivated by contract, by an old man, his wife, son and daughter-in-law. The area is $26\frac{3}{4}$ gunthas. The terms of contract are not reported. The assessment is Rs. 3-10-5 per acre. The experimenter says : "At the time of original survey the field was covered by salt water at time of spring tides and even now at very exceptional times the water covers it. But since original survey the embankments in other lands nearer the creek have been much enlarged and the value of the land improved."

One maund of rice was borrowed as seed on the condition that two maunds would be returned at harvest time. The seed-bed was 3 gunthas in extent and was on high lying *varkas* land. Fifty-four pounds of seed was sown on the 3 gunthas. The seed-bed was burnt with rab material and produced sufficient seedlings for the field. But some of the seedlings were destroyed after transplantation by heavy rain, and the seed not sown in the seed-bed, eighteen pounds, was broadcasted by hand in the field. If such was the case the produce from the seed must have ripened later than that from the transplanted seedlings, and I fail to see how the crop could have been quite even as reported. Heavy late rain belated reaping, and perhaps the produce of the broadcasted seed had time to reach maturity.

Outturn results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Experiment No. 125	16	2,079	3,056	44 3 7	3 10 5	8·25

Ratna'giri.

Mr. Crump was requested to take two experiments on rice and two on *til*. He could conduct none owing to his detention at head-quarters and then proceeding on leave. Mr. Kelkar was asked to do eight experiments on *varkas* crops in the Devgad táluka. He has submitted six careful and well reported tests.

Mr. V. R. Kelkar, District Deputy Collector,

Submits six experiments on *varkas* crops in the Devgad táluka. These were specially ordered by the Commissioner with a view to ascertain the fairness or otherwise of the survey assessment in certain Khoti villages, from which complaints of over-assessment had been received by Government. Mr. Ozanne has already submitted his report on these experiments and has shown that the burden of assessment on gross produce in well selected *varkas* lands, after making full allowance for years of fallow, is fairly moderate. I will report the results below without entering into the disputable question which has been gone into at considerable length by the experimenter, *viz.* whether the Khot is a loser or gainer by his transactions. They may briefly be summarised in the following table :—

	Full period of rotation.		Crop experimented upon.	Anna Estimate.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment on gross value of	
	Years of cropping.	Years of fallow.			Principal Product.	By-product.			Tested crop.	Crops raised during period of rotation, inclusive of years of fallow.
				As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.		
First field (Exp. No. 126) ..	3	8	Sarvat rice.	5	254	506	5 14 1	0 4 0	4·25	12 21
Second do. (Do. No. 127) ..	5	7	Barag ...	9	670	...	10 10 1	0 4 0	2·35	6·50
Third do. (Do. No. 128) .	3	4	Niger ...	6	169	...	5 7 10	0 8 0	9·10	11·12
Fourth do. (Do. No. 129) ...	4	6	Rági ..	12	1,217	...	20 4 2	0 4 0	0·05	4·95
Fifth do. (Do. No. 130) ...	4	8	Kodra ...	8	714	...	6 12 11	0 4 5	4·05	8·88
Sixth do. (Do. No. 131 ...	2	20	Rági ..	12	1,120	...	20 1 10	0 2 0	0·47	6·23

The crop in the fourth field was liberally manured and otherwise well managed. That in the sixth field was the first crop taken after a long fallow and was moreover lightly manured. In both fields the outturn results are satisfactory ; whilst in the other tests they range from fair to poor. The worst results are to some extent attributable to poor farming. The season was favourable. The experimenter's anna estimates are probably pitched too low.

The incidence of assessment as shown in column 10 is very moderate except in the first and third tests. In these latter the outturn is poor, and the poorness may be attributed to preventible causes. The figures in the last column are intended to show the incidence of the total assessment exigible during years of cropping and fallow on the gross value of produce obtained during the years of cropping. There are too many factors of uncertainty to make these figures quite trustworthy No count is taken of the value of the land for grazing or for ráb during the years of fallow. Only one of the crops of the rotation has been tested in each holding, the probable outturn for the other crops of the rotation being only estimated. Nevertheless, the crops experimented on include most of the crops grown in the common rotations of the tract, and it might be argued that the yield of each of the crops of a rotation on a particular field might be

approximately estimated from the actual outturn obtained on other similarly assessed fields in the same locality. This would no doubt be the case if each holding was equally well or equally badly farmed, if the rotations of crops and periods of rotation and of fallow were in each holding the same, if the soils of the tested fields were of like character as to levelness and depth, and if there was no change in prices or in the character of the seasons during the whole period of rotation. The differences between all the tested fields in these respects are such that the outturn of a crop as found in one field cannot be made applicable to the others. Mr. Kelkar has done the best he could under the circumstances and on hearsay evidence has estimated the average outturn of other crops grown in rotation with the crop actually tested. His estimates may be taken as fairly approximate. They prove that the incidence of assessment on gross produce, allowing for years of fallow, is in no case high.

Sarvat or *sonphal* (red) rice (Exp. No. 126) was the first crop tested. It was grown on upland level *varkas* land with a layer of only 3 or 4 inches of earth over sheet rock. The land is never manured. It grows *barag*, niger seed and rice or *harik* in succession after lying at rest for 8 years. Season was favourable. The low outturn is attributed to slight injury done by caterpillars and to careless cultivation. It is probably chiefly due to the land being more or less exhausted, this crop being the last of the customary rotation. The following table gives the value of the average outturn obtained from this field as estimated by the experimenter :—

Crop.	Value of Outturn per Acre.	Assessment per Acre.	Average Incidence of Assessment.	Remarks.
	Rs. a. p.	Rs. a. p.	Per cent.	
Barag (first crop)	10 10 1	0 4 0	...	Estimate.
Niger (second crop)	6 0 0	0 4 0	...	Do.
Rice (third crop)	5 14 1	0 4 0	...	Actual.
Fallow (8 years)	...	2 0 0	...	
Total ...	22 8 2	2 12 0	12·21	

The estimated value of the first crop is based on the actual outturn figures obtained in Mr. Kelkar's second experiment, where however the crop was the third in the rotation. Therefore the estimate is not too high, but is probably too low. The niger seed estimate is certainly not too high for a second rotation crop after 8 years' fallow.

Black *barag* (Exp. No. 127) was the subject of Mr. Kelkar's second experiment. The field was almost level and the soil had a tinge of red. No manure is ever used and the field is allowed to lie at rest for 7 years after 5 years' cropping. The crop tested was the third in the rotation. Season was favourable and cultivation careful. The crop yielded 676 lbs. of grain worth Rs. 10-10-1 per acre. This represents a 17-anna outturn according to the formulæ. The following table shows the gross average outturn estimated by the experimenter for this field :—

Crop.	Value of Outturn per Acre.	Assessment per Acre.	Average Incidence of Assessment.	Remarks.
	Rs. a. p.	Rs. a. p.	Per cent.	
Kulith (first crop)	5 8 0	0 4 0	...	Estimate.
Harik (second crop)	15 0 0	0 4 0	...	Do.
Barag (third crop)	10 10 1	0 4 0	...	Actual.
Niger (fourth crop)	6 0 0	0 4 0	...	Estimate.
Sáva (fifth crop)	9 0 0	0 4 0	...	Do.
Fallow (7 years)	...	1 12 0	...	
Total ...	46 2 1	3 0 0	6·50	

Mr. Kelkar probably over-estimates the value of *harik*. An average of 12 experiments taken in some of the tálukas of this district during the last 5 years gives the acre value at Rs. 7-13-10. In Mr. Kelkar's fifth experiment it comes to Rs. 6-12-11, but the crop there occupies the third place in a series of four crops, while in the present test it occupies the second place in a series of five crops. It is improbable that *sáva*, the last crop in the rotation, would yield Rs. 9 worth of produce per acre. But even if considerable reductions were made on their account the incidence of assessment on value of gross produce would still be quite moderate.

Mr. Kelkar's third experiment (No. 128) was on niger seed, which was the last crop in the rotation. The soil is more highly assessed than that of any other fields experimented upon and grows *barag*, *harik* and niger seed in succession after 4 years' fallow. The outturn is poor, probably because of careless cultivation and the exhausted condition of the soil. The average incidence of assessment based on the experimenter's estimates works out as under :—

Crop.	Value of Outturn per Acre.	Assessment per Acre.	Average Incidence of Assessment.	Remarks.
	Rs. a. p.	Rs. a. p.	Per cent.	
Barag (first crop)	18 0 0	0 8 0	...	Estimate.
Harik (second crop)	8 0 0	0 8 0	...	Do.
Niger (third crop)	5 7 10	0 8 0	...	Actual.
Fallow (4 years)	...	2 0 0	...	
Total ...	31 7 10	3 8 0	11·12	

In this case no good purpose can be served by trying to draw deductions from the outturn results of the tested field or from the experimenter's estimates of the yields of the other crops of the rotation. The field bears a higher assessment than any of the other fields experimented upon and under good management ought to be more productive than the other fields. If the crop tested is not decidedly under average the burden of assessment would be heavy. The whole crop only occupied 12 gunthas, of which 8 were actually tested.

Rági formed the subject of Mr. Kelkar's fourth experiment (No. 129). It was the second crop in a series of four crops taken after 6 years of fallow. The seed was at first sown in a ráked seed-bed and the seedlings when transplanted were top-dressed with fish manure. The outturn, 1,217 lbs. per acre of grain, worth Rs. 26-4-2, was quite satisfactory. The following table shows the average incidence of assessment calculated on the experimenter's estimates which are, I think, fair. The fish manure applied to the *rági*, and which cost Rs. 5-9-7 per acre, would no doubt keep to defer exhaustion of the soil, so that the crops subsequently taken would be benefited :—

Crop.	Value of Outturn per Acre.	Assessment per Acre.	Average Incidence of Assessment.	Remarks.
	Rs. a. p.	Rs. a. p.	Per cent.	
Kulith (first year)	8 4 0	0 4 0	...	Estimate.
Rági (second year)	26 4 2	0 4 0	...	Actual.
Harik (third year)	10 0 0	0 4 0	...	Estimate.
Niger (fourth year)	6 0 0	0 4 0	...	Do.
Fallow (6 years)	...	1 8 0	...	
Total ...	50 8 2	2 8 0	4·95	

The average incidence is decidedly light. The field is tilled by the occupant conjointly with a partner. Both have agreed to supply labour and to pay

expenses equally; two *páylis* (8 *sers*) per maund of the produce is received by the occupant in right of ownership and the rest divided equally between the two.

Harik was the crop next experimented upon (No. 130). The field has white gravelly soil locally called *khárlat bhardi*. It had been manured for the *rági* which preceded the test crop with a quantity of ashes and cowdung. It grows *kulith*, *nágli*, *harik* and niger after 8 years' rest. Fifteen pounds of seed sown in June produced in the middle of October 714 lbs. of grain which compared with the formulæ standard can be classed as an 18-anna yield. The average incidence of assessment based on the experimenter's estimates is shown below. The *kulith* estimate is, I think, too low and the *nágli* estimate perhaps too high :—

Crop.	Value of Outturn per Acre.	Assessment per Acre.	Average Incidence of Assessment.	Remarks.
	Rs. a. p.	Rs. a. p.	Per cent.	
Kulith (first year)	4 9 2	0 4 5	...	Estimate.
Nágli (second year)	20 9 2	0 4 5	...	Do
Harik (third year)	6 12 11	0 4 5	...	Actual.
Niger (fourth year)	5 5 4	0 4 5	...	Estimate.
Fallow (8 years)	...	2 3 4	...	
Total ...	37 4 . 7	3 5 0	8·88	

The average incidence is less than 9 per cent. on the experimenter's estimates. The test field measures 36 gunthas and is rented by a tenant who pays for the occupancy right one rupee per annum in years of cropping. The average incidence of this rent on the value of estimated produce works out 10·10 per cent.

Mr. Kelkar's last experiment (No. 131) was on *rági* on a very steep stony *varkas* field that grew only 2 crops, *barag* and *rági*, after leaving the land uncultivated for 20 years. The field is so steep that ploughing is impossible. *Rági* was as usual sown at first on rábed seed-bed before being transplanted on the field which has previously been given a light dressing of cowdung and ashes. The outturn is only slightly below that in Mr. Kelkar's fourth test which had the benefit of a liberal application of fish manure. The experimenter estimates the value of the other crop, *barag*, grown in rotation with *rági* at Rs. 18 per acre. The average incidence works out 6·23 per cent. I consider the estimate for *barag* too high.

Ka'nara.

Experiments on *rági* and early and late rice were required from this district Mr. Divátia had arranged for an experiment on *rági*, but had to give it up owing to sudden rainfall which injured the selected crop. Later he could not do any out-door work owing to ill-health. Mr. McNeill could not test *rági* and early rice, as owing to somewhat short rainfall the crops were harvested before the commencement of the touring season. He has sent in two careful tests on summer rice.

Mr. N. B. Divátia, Assistant Collector,

Reports a rice test. The experimenter was prevented from conducting a rice test in the coast villages of Kárwár and Ankola by heavy rain at harvest time and selected a field in the hill side tracts where the rice ripened later. The tested crop (No. 132) was an inferior variety of rice, but was grown from transplanted seedlings. The field has light brown soil. It bears an assessment of Rs. 2-8-0 per acre and grows rice every year. It is irrigable from an adjoining *nála*. The water was deficient this year, being only sufficient for about ¾ of the field. The field as well as the seed-bed was manured with a compost of decomposed cowdung, leaves, ashes and litter. The application was equal to about 3 tons per acre. The seed-rate is reported at 48 lbs. per acre.

Outturn, &c., results are as under :—

	Anna Estimate.	Outturn per Acre.		Value of Outturn per Acre.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
Exp. No. 132 ...	12	1,489	6,482	26 11 2	2 8 0	9·36

The grain was valued at 62½ lbs per rupee.

Mr. J. McNeill, Assistant Collector,

Submits two tests on *vaingan* rice which gave rather poor results as compared with results of other tests on the same crop in former years. The experiments (Nos. 133 and 134) were carefully conducted and well reported. The tests were taken on adjoining survey numbers which are in the occupation of the same Khátedár. Each field grows a rain crop as well as a summer crop of rice.

The soil of each is friable and light. The respective assessments are Rs. 5-5-11 and Rs. 5 per acre. The rain crop and the *vaingan* rice were each directly manured, the latter a short time before sowing. The manure used was a compost of cattle droppings and forest litter. The application to the first field was about 370 head-loads and to the second 470 per acre. The former was considered a light dressing. The seed-rate of the first field, 308 lbs. per acre, is exceedingly high. That of the second, 195 lbs. per acre, does not differ much from the rates reported for the crop in the reports of 1892-93 and 1893-94. The fields are irrigable by channel which dries up about the 1st week in March or a little too soon for the full requirements of the crop. The *vaingan* rice was only grown as usual in a portion of each number. In the first field 2 acres 30 gunthas out of 7 acres 17 gunthas were so cultivated, and in the second 1 acre out of 2 acres 16 gunthas. Other second non-irrigated crops were grown however in both fields but not over the whole area of each.

Mr. McNeill describes the cultivation of the tested crops thus:—

"The first crop on the land was removed about the end of November or beginning of December. Almost immediately the work of preparing the ground for the second crop was begun. The ground was ploughed in one direction, then across, and again as at first. The surface was then smoothed and allowed to rest for a few days. Again it was ploughed; the manure was filled into the muddy ruts, again ploughed cross and smoothed with *Nale* (bullock drawn). An additional levelling was given by two men who dragged across the ground a betel-tree stem by ropes attached to either end. A stone bound up in straw was next pulled in two or three irregular lines over the surface. The object of this dragging of the stone and of the betel-stem is in the one case to make grooves or ruts in the ground by which the water will readily pass to every part of the field and also pass from it; while the betel-stem makes the rest of the surface quite level and facilitates the flow of water over it. These operations being over, the water which had been previously turned on is drained off. The seed is sown broadcast and allowed to germinate for 7 days, when, the seedlings being well up, water is again turned on and is kept at a height of about half a foot until the beginning of March, *i.e.* about 20 days before cutting."

Outturn, &c., results are as under:—

	Anna Estimation.	Outturn per Acre.		Value of Outturn.	Assessment per Acre.	Percentage Incidence of Assessment.
		Principal Product.	By-product.			
	As.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
First field (Exp. No. 133)..	16	960	2,730	18 0 5	5 5 11	30·07
Second do. (Exp. No. 134)...	14	520	2,040	9 15 4	5 0 0	50·21

The value of the rain crop, if added, would of course reduce the incidence. It is doubtful whether the crop of the second test paid expenses.

J. W. MOLLISON,

Poona, 21st October 1895. Superintendent of Farms, Bombay Presidency.

TABULAR SUMMARIES.

Summary of Crop Experiment Reports,

O. S. = Original Survey;

No.	District, Taluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding local funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	AHMADABAD.		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. J. K. N. Kábráji, Assistant Collector.										
1	Daskrohi (Odhav) ...	Gram, 7th April 1895.	20	900	55	1,287	...	23 8 6	4 10 8 R. S.	19·83	0 4
2	Do. (Ghodásar) ...	Do. 19th April 1895.	14	590	33	1,012	...	20 9 0	3 15 4 R. S.	19·25	0 5
3	Do. (do.) ...	Do. do. ...	11	465	34	618	...	12 0 9	5 9 11 R. S.	46·64	0 4
	Mr. Jethálál Varajbhái, District Deputy Collector.										
4	Dhandhuka (Dhandhuka).	Do. 20th February 1895.	12	450	20½	506	230	13 9 6	3 11 4 R. S.	27 28	0 8
5	Do. (do.)	Do. 21st Febr u a r y 1895.	12	450	20½	260	76	6 13 7	4 8 2 R. S.	65·85	0 10
6	Do. (do.)	Do. 22nd Fe b r u a r y 1895.	12	450	20½	439	124	11 7 2	4 3 6 R. S.	36·85	0 10
	KAIRA.										
	Mr E. H. E. Leggatt, Assistant Collector.										
7	Kapadvanj (Daiap) .	Wheat, 20th F o b r u a r y 1895.	12	900	77	642	538	24 1 0	2 7 3 O. S.	10·19	0 8
8	Do. (Navágám).	Do. 26th F e b r u a r y 1895.	8	600	24	241	308	9 11 0	1 10 5 O. S.	17·04	0 8
	Mr. Bamanji Edalji Modi, District Deputy Collector.										
9	Mátar (Radhvánaj) .	Spiked millet (Bájri), 14th October 1894.	14	50	8½	364	1,923	21 1 6	3 14 1 R. S.	18·39	0 8

Northern Division, 1894-95.

R. S.=Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee. Principal Product.	By-Product.	Remarks.
13	14	15	16
Tolas.	Lbs.	Cwts.	
40 (weight Ser).	54⅔	...	*Experiment No. 1.*—Gram grown as a second crop on new *kiari gorádu* soil growing rice every year followed by gram only in years of ample late rainfall. The test crop not directly manured but the rice which preceded it received a liberal dressing of 17 carts of ordinary manure per acre. Tillage good and season favourable. Seed rate high. The outturn nearly 1½ times the maximum crop of the formulæ. Pulse valued rather cheap; the by-product not valued at all though fed to cattle. Test area below the prescribed minimum in this and the following two tests. Incidence on the 2nd crop alone.
Do.	49¼	...	*Experiment No. 2.*—Same crop on unmanured sandy *gorádu* soil growing as above rice followed by a second crop of gram only in years of seasonable late rain. No second crop was raised on the field during the past 6 years. Season and tillage as above. Crop full maximum. Incidence on 2nd crop only.
Do.	51¼	...	*Experiment No. 3.*—Same crop on similar soil on which no crop was raised during the previous year owing to absence of cultivator. Season, &c., as above. Crop 15 annas according to the formulæ.
Do.	41	1⅝	*Experiment No. 4.*—Same crop on an unmanured good black dry-crop land growing usually cotton and *juvár* in alternate years. Gram sown this year owing to partial failure of *juvár* by excessive October rains. Season and tillage good. Seed rate low. Burden of assessment in this and the following 2 tests cannot fairly be gauged by the value of the test crops as these were merely catch crops intended to minimise the cultivator's loss consequent upon an unfavourable season.
Do.	41	1⅓	*Experiment No. 5.*—Do. do. do. Tillage indifferent. Crop only 7 annas.
Do.	41	1½	*Experiment No. 6.*—Do. do. do. Tillage good.
Do.	29½	1⅙	*Experiment No. 7.*—Unirrigated wheat as a second crop on *kiari* land growing rice followed by wheat for the last 3 years. The first crop manured with 16 carts of ordinary manure per acre. Cultivation very careful and season very fair. Crop only 8 annas according to the formulæ.
Do.	29½	1⅙	*Experiment No. 8.*—Same crop on dry-crop land under similar rotation. Tillage bad, the field being full of weeds. Seed rate very low and the outturn represents only a 3-anna crop of the formulæ.
Do.	32⅛	1⅛	*Experiment No. 9.*—*Bájri* with pulse mixtures on a light *gorádu* soil growing (1) *bájri*, (2) *kodra* with subordinate pulses and (3) *bávto* in succession. No manure applied for the test crop but the land liberally treated with 30 carts per acre of ordinary manure during the past two years. Crop damaged by excessive rain during the flowering period, which reduced the outturn to 6-anna yield of the formulæ. Tillage good. By-product valued very high at Rs. 10 per acre. Outturn of subordinate pulses neglected.

Summary of Crop Experiment Reports,

O. S. = Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
			Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	KAIRA—*continued.*										
	Mr. Bamanji Edalji Modi, District Deputy Collector—continued.										
10	Mátar (Khadiál-pura),	Spiked millet (Bájri), 22nd October 1894.	16	975	10	585	1,395	23 7 0	4 8 3 R. S.	19·26	0 8
	PANCH MAHA'LS										
	Mr. B. R. Heblikar, District Deputy Collector.										
11	Jhálod (Jhálod), ...	Rapeseed (Sarsav), 12th March 1895.	12	450	13⅓	359 seed.	848	17 13 0	2 0 0 R. S	11·22	0 8
12	Dohad (Dohad) ...	Gram, 18th March 1895.	16	975	50	1,313	1,313	22 10 8	1 13 9 R. S.	8·20	0 10
13	Do. (Nágrála) ...	Do. , 22nd March 1895.	12	730	46	846	615	14 6 0	1 4 9 R. S.	9·02	0 8
	Mr. Pránlál Harkisanlás, District Deputy Collector.										
14	Kálol (Vejalpur) ...	Eleusine Coracana (Bávto), 1st November 1894.	12	1,010	9	651	2,706	15 3 0	1 11 10 O. S.	11·35	0 8
15	Do. (do.) ...	Do. do. ...	12	1,010	10	651	2,651	15 1 2	1 10 8 O. S.	11 06	0 15
16	Do. (Chimanpur)...	Do. do. ...	10	840	9	691	2,640	15 14 6	0 11 7 O. S.	4·56	0 10

Northern Division, 1894-95—continued.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee. Principal Product.	By-Product.	Remarks.
13	14	15	16
Tolas.	Lbs.	Cwts.	
40 (weight Ser).	32⅘	2⅛	*Experiment No. 10.*—*Bájri* with similar mixtures on similar soil manured with 10 carts per acre of farm yard manure. *Bávto* grown on the land in each of the three previous years. Seedlings from the first sown seed eaten up by caterpillars; a fresh sowing was therefore made late in July. Season, &c., as above. Tillage very careful. Crop 10 annas of the formulæ. The subordinate pulse failed entirely owing to unseasonable sowing.
Do. ...	20½	24	*Experiment No. 11.*—Rapeseed as a second crop on *gorádu* soil growing maize every year followed by wheat, gram or rapeseed. The first crop manured with 10 carts of cowdung per acre. Season good; but tillage indifferent. Seed rate nearly double the formulæ standard. The outturn only a 9-anna crop of the same standard. Incidence on 2nd crop only, and hence very light.
Do. ...	61½	8⅘	*Experiment No. 12.*—Gram on similar soil after maize which had received a liberal dressing of 16 carts of cowdung per acre. This field grows maize every year followed by either gram alone or with rapeseed. Season and tillage both good. Outturn full maximum.
Do. ...	61⅓	8⅘	*Experiment No. 13.*—Do. do. Soil lightly dressed with 6 carts of cowdung per acre for the first crop. Rotation :—(1) rice and tobacco, (2) and (3) maize and gram. Season, &c., as above. Crop 14 annas.
Do. ...	46⅘	22	*Experiment No. 14.*—*Bávto* with *math* on red *gorádu* soil growing without manure *bájri* and *bávto* with pulses on different parts of the field. Late heavy rain damaged the crop to some extent. Tillage good. Subordinate crop being unripe at date of experiment was not tested. Seven gunthas of seed-bed furnished seedlings for an acre of plantation. Outturn represents an 8-anna crop of the formulæ.
Do. ...	46⅘	22	*Experiment No. 15.*—*Bávto* without any mixture grown continuously on red brown *gorádu* soil. Season, &c, as above. Seedlings from 5⅓ guntha seed-bed sufficed for an acre of transplantation.
Do. ...	46⅘	22	*Experiment No. 16.*—Same crop with *math* as in experiment No. 14 on brown *gorádu* soil manured with about 15 carts of cowdung per acre. Rotation :—*bájri* with pulses grown in alternate years with *bávto*. Season, &c., as above. Area of seed-bed per acre of transplantation reported at 4⅔ gunthas in the case of this field. Subordinate crop not tested.

Summary of Crop Experiment Reports,

O. S. = Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5		7	8	9	10	11	12
	BROACH. *Mr. Phirozshâh Pestanji, District Deputy Collector.*		Annas	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
17	Ankleshvar (Pánoli). *Mr. J. W. S. Dracup, District Deputy Collector.*	Rice (Jádu sáliu), 20th October 1894.	18	1,750	100	2,769 in husk	1,900	52 8 5	10 0 0 O. S.	19·03	0 8
18	Amod (Bhimpura) ...	Chickling Vetch (Láng), 15th February 1895.	11	465	41	768	1,050	22 3 5	5 3 8 O. S.	23·54	0 8
19	Do. (Rohodh) ...	Great millet (Juvár), 15th February 1895.	14	920	9	468	1,570	16 12 4	4 10 6 O. S.	27·76	0 8
20	Jambusar (Tundaj)... *Mr. Sorábshâh Hormasji, District Deputy Collector.*	Wheat (Hánsia), 28th February 1895.	19	1,220	43	742	790	24 13 6	3 11 4 O. S.	14·95	0 8
21	Ankleshvar (Gadkhol).	Cotton (Deshi), 22nd and 30th March, 13th April and 1st May 1895.	10	280	9¾	227 seed cotton.	...	17 6 9	5 12 3 O. S.	33·09	0 10
22	Do. (Málanpor).	Sesamum (Til), 31st January 1895.	12	450	1	153 seed.	...	11 5 8	3 8 0 O. S.	30·82	0 8
	SURAT. *Mr. P. R. Cadell, Assistant Collector.*										
23	Jalálpur (At) ...	Sugarcane (Vánsi), 27th January 1895.	16	5,250	2,084 whole canes.	4,945 gul.	5,010 bundles of leaves.	265 2 3	13 8 8 O. S.	5·10	0 4

Northern Division, 1894-95—continued.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
40 (weight ser).	54⅔	9	*Experiment No. 17.*—*Jádu sálin* or inferior rice grown continuously on fairly good crumbling black soil commanded by the village tank from which the crop was irrigated this year only once at the beginning of October. Seedlings from one guntha of seed-bed covered 12 gunthas of the field. The seed-bed alone was manured with about 5 carts of farm yard manure. Season very favourable; but tillage reported to be indifferent. Weeding was neglected and embankments that had been washed away were not repaired. Seed rate very high. Outturn very satisfactory being more than maximum of the formulæ (2,000 lbs.).
Do. ...	62½	1 nearly.	*Experiment No. 18.*—*Láng* or chickling vetch on deep black low-lying land growing, without manure, cotton alternately with *juvár*, *láng* or wheat. The crop was unseasonably sown, excessive rain at end of October rendering the field unfit for earlier sowing. Later on, cloudy weather brought on caterpillars which damaged the crop to a considerable extent throughout the district. Tillage good. The yield represents an 18-anna crop of the formulæ, though estimated at 11 annas only. By-product valued very high, at about 106 lbs. per rupee.
Do. ...	42⅓	2⅛	*Experiment No. 19.*—Rabi *juvár* on a similar field lightly dressed with ordinary manure and growing as above, cotton in alternate years with *juvár*, *láng*, wheat or *tur*. Season, &c., as above. First owing destroyed by excessive rain; seed sown again very late in the season. The crops represented only a 7-anna formulæ outturn.
Do. ...	33⅓	2½	*Experiment No. 20.*—Unmanured and unirrigated wheat, *hánsia* on similar soil growing (1) cotton and (2) wheat or *juvár*. Season fairly good for this crop and tillage also good. Seed rate low. The outturn over estimated at 10 annas, being only 12 annas according to the formulæ standard.
Do. ...	13⅕	...	*Experiment No. 21.*—Cotton on good black soil manured in the previous year by folding sheep. Rotation:—(1) cotton, (2) sesamum and *tur* and (3) cotton and rice. Excessive rain in the beginning of the season prevented timely sowing, and the heavy cyclonic rains in October-November damaged the crop considerably. Further there was dropping of bolls, owing to excessive cold on 3 consecutive nights in January. Season unfavourable. Crop picked four times, the last 3 pickings being supervised by Mámledár. Outturn 8 annas of the formulæ.
Do. ...	13⅓	...	*Experiment No. 22.*—Sesamum on fair black soil alternating with cotton. Field lightly manured by folding sheep in the previous year. Season very unfavourable, late rains in October proving injuriously heavy for sesamum. Tillage good. Outturn poor, being only a 4-anna crop according to the formulæ. Incidence of assessment in consequence somewhat high.
37½ (weight Ser).	20⅓	200 bundles of leaves.	*Experiment No. 23.*—Sugarcane *Vánsi* on rich *kiari* land growing rice followed by *val* for 4 years and by sugarcane in the 5th. Field manured with 20 cart-loads of cattle dung per acre and about Rs. 16 worth of castor-cake per acre was applied as a top dressing. Crop irrigated 14 times from a well in an adjoining field. Season favourable and tillage careful. Crushed cane was used as fuel in addition to *tur* stalks and tops were fed to cattle working the mill and therefore their value not entered in column 9. The dry leaves valued very high, at Rs. 25 per acre.

Summary of Crop Experiment Reports,

O. S.=Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	THA'NA.		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. L. G. Deshmukh, Assistant Collector.										
24	Sl áhápur (Mokhávne)	Eleusine coracana (Nágli, white), 9th November 1894.	16	800	8	581	...	13 2 0	0 2 11 O. S.	1·31	0 8
25	Do. (do.).	Do. (red), do.	20	1,000	8	890	...	19 6 0	0 3 4 O. S.	1·07	0 8
	Mr. U. W. M. Hudson, Assistant Collector.										
26	Dáhánu (Káse) ...	Gram, 5th March 1895.	18	450	118	957	...	33 7 0	1 8 11 O. S.	4·65	0 8
27	Do. (Umbargaon).	Large fruited dolichos (Vál) 31st March 1895.	·11	230	75	760	1,261	16 4 0	3 13 4 O. S.	23·59	0 8
	Mr. V. R. Patvardhan, District Deputy Collector.										
28	Bhivandi (Nánditne).	Gram, 13th March 1895.	16	400	74	827	...	22 6 4	1 7 7 O. S.	6·58	0 10
29	Do. (do.).	Do. do.	8	100	74	281	...	7 9 7	3 12 5 O. S.	49·69	0 10
	Mr. F. H. Hearn, Deputy Superintendent, Konkan Revenue Survey.										
30	Bassein (Boling) ...	Sugarcane, 24th March 1895.	14	3,350	2,200 canes.	5,789 gul.	14,820 tops.	262 0 0	4 7 7 O. S.	1·70	0 2
31	Máhim (Pásthal) ...	Lucerne grass, 18th February 1895.	...	...	...	6,824	...	85 4 9	3 14 9 O. S.	4·59	0 9½
	Mr. A. G. Hudson, Assistant Superintendent, Konkan Revenue Survey.										
32	Sálsette (Mulund) ...	Phul or Bondhani grass.	18	...	...	3,968	...	27 6 6	0 14 0 O. S.	3·19	0 10
33	Do. (Náhur) ...	Do. ...	20	...	...	4,110	...	28 0 0	1 11 11 O. S.	6 25	0 10
34	Do. do. ...	Do. ...	20	...	...	4,904	...	32 11 6	2 0 1 O. S.	6·11	0 10
35	Do. (Mulund) ...	Do. ...	11	...	...	1,764	...	21 0 0	0 11 6 O. S.	3·57	0 10
36	Máhim (Tembode) ...	Do. ...	20	...	...	4,760	...	19 12 10	0 2 10 O. S.	0·94	0 10
37	Sálsette (Mulund) ...	Ber grass ...	11	...	...	3,164	...	16 0 0	5 4 10 O. S.	36·71	0 10

Northern Division, 1894-95—concluded.

R. S.=Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
54	44⅓	...	*Experiment No. 24.*—*Nágli* on unmanured upland *varkas* land, growing *nágli* for 2 years in succession after lying fallow for one year. Proportionate area of seed-bed to that of field ascertained to be as 1 : 4. Season on the whole good. Late heavy rains did little injury to this crop as compared to rice. Tillage careful. Crop 13 annas of the formulæ.
56	46	...	*Experiment No. 25.*—Same crop on more favourably situated land, being just below the village manure heaps and receiving their wash during rain. *Nágli* is followed by *vari* and *udid* and then the land is allowed rest for a year. Other conditions as above. Crop 18 annas of the formulæ.
70	28⅛	...	*Experiment No. 26.*—Gram as a second crop on good but unmanured rice land retentive of moisture, growing rice followed by gram in each of the past 3 years. Late rains which injured the kharif crop benefited the pulse. Tillage good. Seed rate very high. Outturn nearly double the maximum crop of the formulæ standard. Incidence very low though on the second crop alone.
74½	50⅜	9	*Experimet No. 27.*—*Vál* on good kharif land growing rice every year followed by a second crop only in years of favourable rainfall. The late heavy rains of this year prevented even germination; otherwise the season was good. The reported seed rate very high. The outturn is probably much under-estimated.
72	36⅛	...	*Experiment No. 28.*—Gram on good *rabi chikanvat* land growing the same crop every year without any manure. Season favourable and tillage good. Seed rate rather high. Outturn more than double the formulæ yield for a 16-anna crop.
72	Do.	...	*Experiment No. 29.*—Same crop on unmanured *kharif* land growing rice every year followed by a second crop of gram or *vál* only in years of favourable rainfall. Season as above, but tillage indifferent. Outturn represents a 13-anna crop of the formulæ. Incidence on the second crop alone.
28	23	13½	*Experiment No. 30.*—Dark purple sugarcane on black clay soil with a substratum of silt, growing sugarcane or plantains in alternate years with rice seedlings, followed by *san* hemp in the same year. Crop not manured before plantation, but 3 top dressings of castor-cake given; the first two months after plantations, the 2nd and 3rd, at intervals of a month afterwards. Crop irrigated every 8—10 days during the fair season from a well by means of a Persian wheel. Season favourable and tillage good. Crushed cane used as ráb. The tops fed to cattle working the mill valued at Rs. 10 per acre. Crop more than maximum according to the formulæ.
...	80	...	*Experiment No. 31.*—Lucerne on good black clay soil growing rice in the monsoon followed by lucerne in the fair season. Field manured with 6 carts per acre of goats' dung. Five cuttings usually are taken. Outturn in Column 7 represents the yield of the second cut only.
...	145	...	*Experiments Nos. 32-35.*—*Phul* or *bondhani* grass on *varkas* land growing the same crop annually for export to Bombay, the fields being favourably situated in respect of railway communication. Season favourable. Outturn good except in No. 35. The grass valued very high in the last test.
...	147	...	
...	150	...	
...	84	...	
...	240	...	*Experiment No. 36.*—Same grass on land classed as *rabi* but having *murum* underneath, declared unsuitable for growth of *rabi* crops. Outturn good but valued very cheap.
...	198	...	*Experiment No. 37.*—*Ber* grass on rice land left fallow for grass for the past 10 years, being unfavourably situated for rice owing to long distance from village. Season as above. Grass valued low as compared with the above experiments.

Summary of Crop Experiment Reports,

O. S. = Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	Fy-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	KHANDESH.		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. K. R. Ramanji, Assistant Collector.										
38	Sindkheda (Nevádé)	Wheat (Gore) 9th February 1895.	16	800	71	661	897	17 12 1	2 15 2 R. S.	16·60	0 15
39	Do. (do.)...	Do. (do) .	16	800	71	502	615	13 4 3	2 15 1 R. S.	22·18	0 12
	Mr. J. H. DuBoulay, Assistant Collector.										
40	Pimpalner (Bhádvi) .	Spiked millet (Bájri), 7th November 1894.	16	640	8	295	575	5 15 4	0 5 10 O. S.	5·54	0 8
41	Do. (Yesur) .	Do. (do.).	20	800	5½	829	2,905	20 15 0	0 9 9 O. S.	2·91	0 8
42	Do. (Sákri) ...	Sesamum (white Til), 7th November 1894.	12	350	5	282 Seed.	...	14 7 3	0 5 9 O. S.	2·48	0 8
43	Do. (Gondás) .	Do. (white and black Til), do.	19	665	2	496 Seed.	...	23 11 2	0 10 11 O. S.	2·87	0 4
			19	665	2	200 Seed.	...	9 7 8	0 10 11 O. S.	7·91	0 4
44	Do. Dahivel).	Wheat (Páthá-di), 25th February 1895.	13	800	51	769	1,190	19 11 5	5 15 0 O. S.	30·11	0 8
	Mr. O. N. Seddon, Assistant Collector.										
45	Sávda (Sávda) ...	Do. (Nim Bansi), 8th February 1895.	18	900	108	803	960	30 7 0	2 10 8 R. S.	8·76	0 10
46	Do. (Yával) ...	Do. do. 24th February 1895.	14	910	94	779	888	29 6 0	2 9 5 R. S.	8·81	0 10
	Mr. S. B. Chitgubi, District Deputy Collector.										
47	Jámner (Neri B.) ...	Do. (Bansi), 12th February 1895.	16	720	65	772	1,231	25 6 8	2 12 5 R. S.	10·92	0 10

Central Division, 1894-95.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
146	45	2 2/7	*Experiment No. 38.*—Dry crop wheat, *gore*, on unmanured black cotton soil growing during the past 3 years wheat, sesamum, gram and tobacco on different parts of the field Heavy rain in October shortly after sowing injuriously affected the crop which was further damaged by stormy weather in January. Tillage careful. Seed-rate more than double the formulæ (32 lbs. per acre). Outturn 14 annas according to the same standard.
146	45	2 2/7	*Experiment No. 39.*—Dry crop wheat, *gore*, on similar but somewhat uneven land which grew during the last 3 years (1) cotton, (2) *bájri* and (3) *jowári*, wheat and tobacco. Other conditions as above. Outturn 12 annas of the formulæ.
151	49½	6	*Experiment No. 40.*—*Bájri* on unmanured light red *barad* soil, which grows *bájri* alternately with sesamum. Tillage indifferent. A prolonged break of 6 weeks in the middle of the season checked crop and reduced outturn to 11 annas of the formulæ.
147	48¼	6	*Experiment No. 41.*—Same crop on good dark soil manured with about 9 cart-loads of cowdung per acre. The following crops were taken during the past four years —(1) sesamum, (2) cotton, (3) *bájri* and (4) *kulthi*. Season as above. Tillage careful. Seed-rate only one-half of the formulæ.
119	20	...	*Experiment No. 42.*—Sesamum on land similar to that in Experiment No. 40 lightly dressed with 9 carts of cowdung per acre. Field ordinarily grows cotton, *bájri* and *kulthi* and occasionally sesamum. Season, &c., as above. Tillage only fair. Seed-rate somewl at high.
119	21	...	*Experiment No. 43.*—Same crop on better class of soil than the above growing cotton, *bájri* and sesamum in succession. Half the field liberally manured with 24 carts of cowdung per acre. The results from this portion are shown separately from those of the
120	21	...	unmanured portion. Season, &c., as above. Compared to the formulæ, the outturn from the manured plot represents a 15-anna crop and that from the other a 10-anna one.
125	41⅔	8½	*Experiment No. 44.*—Irrigated but unmanured wheat on shallow *barad* land with a scattering of stones and growing (1) sugarcane, (2) rice and (3) wheat in consecutive years. Season fair. Tillage indifferent. Incidence rather high.
144	29⅓	2¾	*Experiment No. 45.*—Dry crop wheat, *nim bansi*, on black cotton soil lightly dressed with 5 carts of ordinary manure per acre. Rotation, (1) wheat and cotton, (2) *jowári* with pulses and (3) wheat. Season fairly good. Tillage careful. Seed-rate very high Outturn full average.
144	29½	2¾	*Experiment No. 46.*—Same crop on similar land growing cotton, *jowári* and wheat on different parts of the field. Garden crops are also grown under irrigation from a recently constructed well. Crop unmanured ; irrigated twice late in the season. Season as above. Tillage indifferent.
151½	37¼	4	*Experiment No. 47.*—Wheat, *bansi*, on good black cotton soil manured with about 6 carts of cowdung per acre and growing during the last three years (1) *jowári* and wheat, (2) cotton and wheat and (3) cotton, wheat and *jowári*. Season fair and tillage careful. Seed-rate in this and the following two tests much above average, the corresponding formulæ rate being 32 lbs. per acre. Sample ser gave an excess of 7½ tolas in this office.

Summary of Crop Experiment Reports,

O. S.=Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	KHA'NDESH— *continued.* *Mr. S. B. Chitgubi, District Deputy Collector* —continued.		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
48	Jámner (Neri B.) ...	Wheat (Bansi), 12th February 1895.	16	720	80	904	1,292	29 6 5	2 3 8 R. S.	7·58	0 8
49	Do. (Jámner) ...	Do. 28th February 1895.	18	810	54	696	1,313	26 11 10	2 8 5 R. S.	9·44	0 10
50	Chálisgaon (Chálisgaon).	Spiked millet (Bájri), 5th November 1894.	16	640	5⅛	258	1,568	8 0 6	0 10 6 O. S.	8·17	0 10
51	Do. (do.) ...	Do. (do.) ...	16	640	4¾	418	1,369	12 7 4	1 2 2 O. S.	9·11	0 8
52	Do. (do.) ... *Mr. Kázi Kamruddin, District Deputy Collector.*	Do. (do.) ...	16	640	4⅛	362	1,037	10 10 10	0 15 0 O. S.	8·78	0 10
53	Dhulia (Vadjai) ...	Do. (do.) 20th October 1894.	10	250	4⅜	511	1,546	16 7 9	1 4 0 O. S.	7·58	0 8
54	Do. (Sávalde) ...	Do. (do.), 22nd October 1894.	8	160	9	240	769	7 5 11	0 6 3 O. S.	5·30	0 8
55	Amalner (Amalner) ... **NA'SIK.** *Mr. R. B. Stewart, Assistant Collector.*	Wheat (Bansi), 12th February 1895.	12	500	73	735	1,380	26 3 2	2 6 6 R. S.	9·18	0 10
56	Kalvan (Kalvan) ...	Sugarcane (Kade Us), 6th to 8th March 1895.	18	5,400	2,000 canes.	8,000 gul.	...	390 0 0	9 6 2 O. S.	2·40	0 4
57	Báglán (Arai) ... *Mr. G. Carmichael, Assistant Collector.*	Gram, 20th March 1895.	10	190	33	431	400	11 14 0	8 12 0 O. S.	73·68	0 4
58	Niphád (Niphád) ...	Do. 19th January 1895.	14	440	38	570	440	22 6 1	1 8 11 R. S.	6·95	0 6

Central Division, 1894-95—continued.

R. S.=Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee. Principal Product.	Prices of Produce per Rupee. By-Product.	Remarks.
13	14	15	16
Tolas.	Lbs.	Cwts.	
150	37	$4\frac{2}{5}$	*Experiment No. 48.*—Wheat, *bansi*, on similar soil manured with seven carts of cowdung per acre. Rotation: (1) *jowári*, (2) cotton and (3) *jowári*. Season, &c., as above. Outturn full maximum compared to the formulæ standard. Sample weighed in this office 12 tolas short of the recorded weight.
150	$33\frac{3}{5}$	$3\frac{3}{5}$	*Experiment No. 49.*—Wheat, *bansi*, on similar but unmanured soil. Cotton grown in each of the last three years. In 1893-94, cotton and indigo grown mixed. Other conditions same as above.
144	$40\frac{3}{5}$	$4\frac{3}{7}$	*Experiment No. 50.*—*Bájri* unmanured on black soil mixed with lime. Same crop in each of last four years. Field last manured in 1892. Season fairly good and tillage careful. Seed-rate low and crop a 10-anna one according to the formulæ. The sample received in this office gave an excess of $2\frac{1}{2}$ tolas over the recorded weight.
145	41	5	*Experiment No. 51.*—*Bájri* on *ray chikan* reddish black soil growing cotton in years of favourable rainfall; otherwise *bájri*. Field last manured in 1892. Season fairly good and tillage careful. Seed-rate low, and crop a 12-anna one according to the formulæ. Sample ser gave an excess of 3 tolas.
144	$40\frac{4}{5}$	$4\frac{5}{7}$	*Experiment No. 52.*—*Bájri* on *ray chikan* reddish black soil growing cotton in years of favourable rainfall; otherwise *bájri*. Field last manured in 1892. Season fairly good and tillage careful. Seed-rate low, and crop less than a 12-anna one according to the formulæ. Sample $3\frac{1}{2}$ tolas in excess of the reported weight.
145	$44\frac{3}{5}$	$2\frac{5}{7}$	*Experiment No. 53.*—*Bájri* on fairly good red soil growing mostly *bájri* with subordinate mixtures and occasionally cotton also. Field manured every fifth year. About 30 carts of cowdung and other manure spread this year before the test crop was sown. Season unfavourable, the crop having suffered from the long break in the middle of the season. Seed-rate low. Outturn, compared to the formulæ, 14 annas.
140	$49\frac{1}{5}$	$2\frac{5}{7}$	*Experiment No. 54.*—*Bájri* on *barad* land growing *bájri* with mixtures and also cotton on portions of the field. Field manured as above every fifth year, the last dressing having been given in 1892. Season, &c., as above. Yield, compared to the formulæ, 10 annas.
142	$36\frac{2}{5}$	2 nearly.	*Experiment No. 55.*—Dry-crop wheat, *bansi*, on good black cotton soil growing cotton, *jowári*, *bájri* and wheat on different portions of the field. Portion under wheat manured with about 8 carts of cowdung per acre. Season favourable for wheat. Tillage careful. Seed-rate very high. Crop under-estimated at 12 annas, being 15 annas of the formulæ standard.
80	$20\frac{1}{2}$	...	*Experiment No. 56.*—Sugarcane, *kade us*, a thin hard variety on good deep black soil which grew during the last four years, (1) maize and wheat, (2) groundnut, (3) sugarcane and (4) maize and wheat. Crop irrigated from a *bandhára* with perennial water-supply. The extent of irrigation not reported. Field liberally manured with 41 carts of cattledung per acre. Season excellent and tillage good. Seed-rate low.
140	$38\frac{1}{5}$	$5\frac{5}{7}$	*Experiment No. 57.*—Gram as a second crop on similar soil manured with 33 carts of cattle manure and household refuse, and growing *bájri* or sesamum followed by gram almost every year. Occasionally rice is grown. Season good and tillage fair. Outturn poor and incidence, though on a second crop, high.
117	42	$2\frac{1}{8}$	*Experiment No. 58.*—Gram with a sprinkling of *kardai* on friable black soil, *bhurkat*, which grew during the past three years, (1) wheat, (2) *bájri*, gram and linseed and (3) wheat during the past three years. No rain crop taken this year. Crop manured with 6 carts of cowdung and town sweepings per acre. Season favourable and tillage good. Outturn more than maximum of the formulæ (650 lbs.). Sample ser weighed $2\frac{1}{2}$ tolas short of the reported weight.

O. S. = Original Survey;

No.	District, Taluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	NA'SIK—*continued.* *Mr. G. Carmichael, Assistant Collector*—continued.		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
59	Yeola (Nágde) ...	Great millet (Shálu Jowári), 4th February 1895.	6	150	12	171	865	6 11 2	0 9 6 R. S.	8·86	0 8
60	Do. (Nagarsul) ...	Gram, 27th February 1895.	12	325	51	946	385	20 2 6	1 8 2 R. S.	7·49	0 8
	Mr. C. M. Thatte, District Deputy Collector.										
61	Násik (Mahirávni) ...	Eleusine coracana (Nágli); 30th November 1894.	14	1,000	2½	1,168	...	32 0 0	0 4 3 R. S.	0·83	0 10
62	Do. (Násik) ...	Rice (Kamod), 7th December 1894.	8	450	50	2,086 in husk.	...	46 8 0	8 8 3 R. S.	18 31	0 10
	Mr. G. H. Hampton, Assistant Superintendent, Deccan Revenue Survey.										
63	Kalvan (Deuli) ...	Sesamum (white Til), 6th November 1894.	10to 12	220 to 350	4⅘	275 seed.	...	14 13 6	5 13 4 O. S.	39·29	0 4
64	Do. (do.) ...	Do. (red-Til), 9th November 1894.	12	350	2½	108 seed.	...	5 1 8	0 10 0 O. S.	12·24	0 8
65	Do. (Rámeshvar).	Rice (Kamod), 12th December 1894.	16	1,800	24	902 in husk.	...	26 2 9	7 0 5 O. S.	22·37	0 4

Central Division, 1894-95—continued.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
115	63	2	*Experiment No. 59.*—*Jowári* with similar sprinkling on inferior black soil, growing *ba'jri* and *jowa'ri* in alternate years. Sheep were folded on the field but extent of folding not reported. Season unfavourable. Excessive rain in November lodged the crop. Tillage good ; crop poor. Sample gave a difference of 4 tolas.
120	49⅕	3⅔	*Experiment No. 60.*—Gram as a second crop on *shervat* or friable black soil with lime at a depth of 1⅓ foot, growing without manure *ba'jri* followed by wheat or gram with the assistance of water from a *bandhára*. Test crop irrigated, but its extent not recorded. Season favourable and tillage good. Seed-rate above average. Crop 1½ times the formulæ maximum. Sample ser weighed in this office 117 tolas only.
89	36½	...	*Experiment No. 61.*—*Na'gli* on reddish *mál* stony soil, growing without manure two crops of *na'gli* after one year's fallow ; 1½ gunthas of seed-bed sown with 2½ lbs. of seed is said to have furnished seedlings sufficient for an acre of plantation. This is doubtful. Season good ; tillage indifferent. *Na'gli* valued rather high, while the by-product not valued at all.
82	45	...	*Experiment No. 62.*—Rice, *kamod*, on good black soil, growing in successive years (1) groundnut, (2) rice and (3) sugarcane. Field prepared for rice by ploughing in a green manure crop of *san* hemp. Crop watered from a *pa't*. Seed-rate high. Outturn much under-estimated at 8 annas, the formulæ value for a similar crop being 18 annas.
113	18½	...	*Experiment No. 63.*—White sesamum on shallow *barad* soil mixed with *murum* and irrigated from a *pa't*, charge for which has been included in the assessment. Rotation during the last three years :—(1) *ba'jri* and gram, (2) *ba'jri* and (3) sugarcane. The last named crop was grown before the tested crop and was liberally manured. Drought in the middle of the season, and heavy rain at end of monsoon injuriously affected the tested crop. Tillage good. Seed-rate high. The cultivator intended to grow wheat as a second crop after *til*, and as the wheat would get the whole benefit of the *pa't* water, it ought to bear the chief part of the assessment.
120	21	...	*Experiment No. 64.*—Red sesamum on light unmanured *barad* soil growing *ba'jri*, linseed, and *til* without any fixed rotation. Season as above ; the crop withered owing to the lengthy drought ; and outturn 7 annas according to the formulæ standard.
105	34½	...	*Experiment No. 65.*—*Kamod* rice broadcasted on low-lying fairly good rice land, which grows *bájri*, *til*, sugarcane and rice ; the first two followed by wheat as a second crop. No manure used for the rice which was irrigated by channel from a *bandhára* with ample water. Season excellent. Tillage good. The crop lodged. Seed-rate, 24 lbs. per acre, is under average for broadcast sowing. Outturn 11 annas of the formulæ. By-product left on the field to rot ; hence neither weighed nor valued.

Summary of Crop Experiment Reports,

O. S.=Original Survey;

No.	District, Taluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	NA'SIK—*continued.*		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. G. H. Hampton, Assistant Superintendent, Deccan Revenue Survey—continued.										
66	Kalvan (Rámeshvar).	Rice (Kamod), 18th February 1895.	16	1,800	...	1,523 in husk	...	43 5 9	7 0 3 O. S.	13·47	0 4
	Mr. Ichhárám Bhagvándás, Ag. Superintendent, L. R. and Agriculture, C. D.										
67	Málegaon(Málegaon),	Linseed(Javas), 8th February 1895.	16	400	9	207 Seed.	...	12 8 5	1 5 0 O. S.	10·47	0 8
68	Do. (do.)	Do. (do.)	20	500	8½	297 Seed.	...	17 14 8	1 11 6 O. S.	9·59	0 8
69	Do. (do.)	Gram, 8th February 1895.	14	400	59	215	150	6 13 2	1 13 8 O. S.	27·17	0 8
70	Do. (do.)	Do. ...	16	480	64	175	150	5 10 0	1 14 2 O. S.	33·51	0 8
	AHMADNAGAR.										
	Mr. V. B. Vádekar, District Deputy Collector.										
71	Koparganon (Gondhavni).	Spiked millet (Bájri), 18th November 1894.	13	415	8	314	676	8 7 1	0 11 2 R. S.	8·26	0 6
72	Do. (do.).	Do. (do.)	11	270	8	198	415	5 6 4	0 7 0 R. S.	8·10	0 6
73	Do. (do.).	Do. (do.)	8	140	8	136	410	3 15 3	0 6 8 R. S.	10·54	0 6
	POONA.										
	Mr. H. W. J. Bagnell, Assistant Collector.										
74	Mával (Vadgaon) ...	Rice(Sál), 17th November 1894.	16	1,200	64	1,170 in husk.	1,720	20 2 6	2 0 3 R. S.	10·00	0 4

Central Division, 1894-95—continued.

R. S.=Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee. Principal Product.	Prices of Produce per Rupee. By-Product.	Remarks.
13	14	15	16
Tolas.	Lbs.	Cwts.	
105	35	...	*Experiment No. 66.*—Same crop on somewhat deeper soil, growing the same crops every year. Sugarcane in the previous year liberally manured, and its residue must have had some effect on the test crop. Other conditions same as above. Yield compared to the formulæ 14 annas.
123	16½	...	*Experiment No. 67.*—Linseed on *káli bhurat*, light black soil manured with about ten carts of town sweepings per acre. Rotation:—(1) *til* and *kulith*, (2) rabi *jowári* and (3) kharif *jowári*. Season favourable and tillage careful. Outturn compared to the formulæ 11 annas.
123	16½	...	*Experiment No. 68.*—Linseed on similar but somewhat superior land manured liberally with about 20 carts of the above manure. Rotation:—(1) cotton and *til*, (2) cotton and *bájri* and (3) cotton and linseed. Season, &c., as above. Crop represents a 13-anna formulæ outturn.
143	33	1	*Experiment No. 69.*—Gram as a second crop after *bájri* on similar but a more highly assessed field growing during the last three years:—(1) *bájri*, (2) *shálu jowári* and linseed and (3) cotton. Field manured for the first crop with about 10 carts per acre of municipal refuse. Season, &c., as above. Seed-rate in this and the following test more than double the formulæ standard. Crop poor, being only 11 annas of the formulæ. Incidence on second crop alone.
143	33	1	*Experiment No. 70.*—Gram as a second crop after *bájri* on similar but a more highly assessed field. Rotation:—(1) *bájri*, (2) *bájri* with mixtures and (3) cotton and *bájri*. Compared with the formulæ crop 10 annas. Incidence calculated on second crop only.
115	41¼	10⅓	*Experiment No. 71.*—*Bájri* with a sprinkling of *tur* and *ambáli* on unmanured reddish brown soil. The same mixed crop is generally grown, *jowári* being occasionally taken. Season reported to be favourable, though the crop must have suffered somewhat from the long break in August. Tillage careful.
116	41⅓	7⅞	*Experiment No. 72.*—Same crop on inferior *barad* or hard brown soil, growing unmanured *bájri* and *jowári* in alternate years. Other conditions as above.
114	40⅞	2	*Experiment No. 73.*—Same crop on similar land. Rotation:—(1) and (2) *bájri*, (3) *jowári* and (4) *bájri*. Tillage indifferent. Season, &c., as above.
78	64	8⅖	*Experiment No. 74.*—Inferior rice, *súl*, on *gadhi* land, growing the same crop every year followed by a second crop of gram in years of favourable rainfall. Seed-bed manured as usual with cowdung, but not the field. Proportionate area of seed-bed to acre of transplantation not ascertained. Season favourable, but cultivation indifferent, weeding being neglected. Sample 2½ tolas short of the recorded weight. Seed-rate very high, the corresponding formulæ rate being only 33 lbs.

Summary of Crop Experiment Reports,

O. S.= Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	POONA—*continued.*		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. H. W. J. Bagnell, Assistant Collector. —continued.										
75	Mával (Vadgaon)...	Eleusine coracana (Nágli or Rági), 17th November 1894.	16	1,200	20	942	1,025	19 14 4	0 6 2 R. S.	1·93	0 8
76	Haveli (Loni Kálbhar). *Mr. A. S. A. Westropp, Assistant Collector.*	Spiked millet (Bájri), 7th November 1894.	12	400	6½	522	1,220	15 15 7	1 6 2 R. S.	8·67	0 8
77	Purandhar (Pur) ...	Eleusine coracana (Nágli or Rági).	18	1,170	4¼	1,309	20 bundles.	27 14 11	0 7 0 R. S.	1·56	0 8
78	Bhimthadi (Vásunde).	Great millet (Jowári) and Safflower (Kardai). ...	11	410	$4\frac{11}{13}$	104	300 bundles.	5 7 11	0 7 11 R. S.	·01	0 8
	Mr. J. W. Mollison, Superintendent of Farms.		11	40	$1\frac{9}{10}$	89	...	1 9 0			
								7 0 11			
79	Khed (Chákan) ...	Red Onions (Kándo), 5th May 1895.	18	9,000	8·9 sers.	35 022	...	235 0 0	2 9 0 R. S.	1·09	0 4·5
80	Do. (do.) ...	Do. (do.) ...	14	7,000	8·9 sers.	19,228	...	128 5 5	2 13 9 R. S.	2·22	0 4·3
81	Do. (do.) ...	Do. (do.), 6th May 1895.	18	9,000	8·9 sers.	34,514	...	228 0 7	4 1 10 R. S.	1·97	0 3·5
	SHOLAPUR. *Mr. B. C. H. C. Kennedy, Assistant Collector.*										
82	Karmála (Rople) ...	Groundnut, 14th and 15th February 1895.	11	1,500	106	2,358in shell.	2,000	66 1 11	1 7 11 R. S.	2·27	0 5

Central Division, 1894-95—continued.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
85	52½	4⅛	*Experiment No. 75.*—*Nágli* or *rági* on *málvarkas* land, growing without manure, one crop of *til* followed by 3 of *rági* after a year's rest. Seed-bed rábed with cowdung and grass but its proportion to area of field not reported. Season as above. Tillage good. Seed rate more than double the formulæ rate and outturn 14 annas compared to the same standard.
94¾	37	5⅛	*Experiment No. 76.*—*Bájri* unmanured on *khárvat chopan* soil, growing mostly *bájri* but occasionally *jowári*. Field lay fallow in 1892-93. Rainfall sufficient and seasonable but cultivation indifferent. Crop 14 annas according to the formulæ.
88	58⅓	4 bundles.	*Experiment No. 77.*—*Nágli* or *ràgi* unmanured on light friable sloping soil, *mulshi*, and growing (1) *nágli* and (2) *sáva* and niger. The test crop was the second *nágli* crop after fallow, the first one having yielded poorly. Seed was at first sown in a rábed seed-bed the proportionate area of which per acre of field not ascertained. Season favourable at first but later rains deficient. Tillage careful. Seed rate low. Outturn maximum according to the formulæ.
90	41½	100 bundles.	*Experiment No. 78.*—*Jowári* mixed with *kardai* on stony black soil growing without manure 3 crops of *jowári* followed by one of *bájri*. Season, &c., as above; cloudy weather late in the season further injured the cereal. Three rows of *kardai* alternated with 21 of *jowári*.
70	57⅛	...	
80 weight.	149	...	*Experiment No. 79.*—Onions on mixed black soil field growing ordinarily *bájri* and onions in one year followed by groundnuts in the second. Groundnut was grown at first. It failed owing to heavy rain and *bájri* was substituted for it which also was a failure. The test crop top dressed with about 17 carts per acre of ordinary manure and watered 9 times from a well in the field. About 4 guntha seed-bed furnished seedlings for an acre of field. A sample kept by the experimenter lost 11 per cent. in dryage in 18 days. This is allowed for in the reported outturn. Season good and cultivation excellent. Crop 3½ times the formulæ maximum standard.
80 weight.	150	...	*Experiment No. 80.*—Onions on lighter soil under similar rotation. Crop manured with about 23 carts per acre of ordinary manure and irrigated 4 times a month. Season as above; tillage good. Crop affected by shade of trees which reduced outturn, which is however nearly double the maximum crop of the formulæ.
Do.	151	...	*Experiment No. 81.*—Same crop on similar land which grew during the last three years (1) groundnut, (2) sugarcane and (3) *bájri* followed by onions. Crop manured with about 18 carts per acre of farm yard manure and watered three times a month from a well and also by channel from a bunded stream which failed in the hot weather. Area of seed-bed $\frac{1}{7}$ of that of the field. Season as above. Cultivation very careful.
80	37⅞	4½	*Experiment No. 82.*—Groundnut on mixed brown soil manured with 30 cart-loads of farm yard manure and town sweepings. Field grew during the previous three years (1) maize (2) onions and (3) spelt wheat. Crop irrigated regularly once a week from a one *mot* well in the field. It was weeded thrice but at date of experiment it was overgrown with grass. Season not favourable and tillage bad. Seed rate high. Outturn poor. Figures in column 7 are for unshelled nuts. The experimenter forwarded a test ser of kernels which weighed 12 tolas short of the recorded weight.

Summary of Crop Experiment Reports,

O. S. = Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
			Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p	Rs. a. p.	Per cent.	A. g.
	SHOLA'PUR —*continued.*										
	Mr. B. C. H. C. Kennedy, Assistant Collector—continued.										
83	Bársi (Kándalgaon)	Gram, 5th December 1894.	8	130	30	294	...	6 9 4	1 0 11 R. S.	16·06	0 5
	Mr. G. Scott, District Deputy Collector.										
84	Sángola (Sángola) ...	Rice (Sál), 22nd November 1894.	12	750	61	760 in husk.	2,017	19 15 6	0 14 8 R. S.	4·59	0 4
85	Do. (Javhále) ...	Gram, 12th February 1895.	12	300	75	1,131	...	25 0 0	0 15 5 R. S.	3·85	0 4
	SA'TA'RA.										
	Mr. W. C. Rand, Assistant Collector.										
86	Sátára (Tásgaon) ..	Do. (do).	14	470	83	264	...	7 6 3	3 1 2 R. S.	41·57	0 8
87	Do. (do.) ...	Do. (do.)	15	520	103	392	...	11 4 10	3 8 0 R. S.	30 97	0 8
88	Koregaon (Koregaon).	Spelt wheat (Khapli or Jod), 4th March 1895.	20	1,800	170	929 in husk.	...	30 15 3	10 13 11 R. S.	35·71	0 4
	Mr. S. R. Arthur, Assistant Collector.										
89	Karád (Mhopre) ...	Spiked millet (Bájri), 13th November 1894.	12	400	15	299	452	11 6 6	0 7 8 O. S.	4·20	0 8
90	Do. (Vasantgadh).	Rice, 12th November 1894.	14	1,000	31	524 in husk.	1,223	17 0 6	2 13 8 O. S.	16·75	0 4

Central Division, 1894-95—continued.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee. Principal Product.	By-Product.	Remarks.
13	14	15	16
Tolas.	Lbs.	Cwts.	
	41¾	...	*Experiment No. 83.*—Unirrigated and unmanured gram, sole crop on a medium black soil, which grow *jowári* during the two previous years. Season unfavourable owing to deficient rainfall. Cultivation bad; field overgrown with *tákla* weeds. Outturn valued at 8 annas only, but represents a 12-anna crop of the formulæ.
113	46⅔	5	*Experiment No. 84.*—Inferior rice, *sál*, on blackish brown dry-crop soil, locally called *marul*, liberally dressed with about 48 carts of farm yard manure per acre. Previous cropping not given, the experimenter simply remarking that it is undefined. The crop watered by rain water impounded by a newly built *tal*. Season average and tillage good. Seed rate high.
147	45¼	...	*Experiment No. 85.*—Gram as a sole crop on a portion of a black soil field, which is classed as *bágáyat*. Maize followed by spelt wheat usually grown. This year gram sown as a change. Field manured at the rate of 30 carts farm yard manure per acre, and the crop reported to have been irrigated twice. Season favourable and tillage good. Seed rate very high. Outturn nearly double the maximum crop of the formulæ.
121	35⅔	...	*Experiment No. 86.*—Gram grown as a second crop on good black soil, growng *bájri* and *jowári* in alternate years, the former followed by gram. Field lightly manured for *bájri* with about 3 cart-loads per acre. Season not favourable owing to insufficient moisture. Tillage good. Seed rate very high. Crop 11 annas of the formulæ. Sample ser received in this office weighed 5 tolas short of the recorded weight. Incidence in this and the following two tests on second crops only.
117½	34⅔	...	*Experiment No. 87.*— Do. do. do. Outturn 13 annas according to the formulæ standard.
111½	30	...	*Experiment No. 88.*—Spelt wheat on blackish *bágáyat* land, which grew during the last three years (1) *rála* and gram, (2) groundnut and (3) *bájri* and *khapli* wheat. *Bájri*, the first crop, was manured with about 18 carts per acre of cowdung. *Khapli* wheat irrigated once a fortnight from a *pát*. Season favourable and tillage good Crop 12 annas according to the formulæ standard, though classed as maximum. Seed rate very high.
111	34	1½	*Experiment No. 89.*—*Bájri* on light *mál* soil manured with folding sheep. Field grows *bájri* and *jowari* in alternate years. Season favourable and tillage careful. Seed rate high.
88	36	4⅓	*Experiment No. 90.*—Rice on salt, *khár*, land manured with 11 carts per acre of cowdung, growing rice every year followed by a second crop of gram only in years of favourable rainfall. Season unfavourable owing to want of timely rain but tillage careful. Seed rate low. Outturn poor, being only 11 annas compared to the formulæ standard.

Summary of Crop Experiment Reports.

O. S. = Original Survey;

	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	SA'TA'RA—*contd.*		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. S. R. Arthur, Assistant Collector —continued.										
91	Karád (Vasantgadh).	Eleusine coracana (Nágli), 16th November 1894.	12	750	27	1,613	2,653	32 8 3	0 9 6 O. S.	1·80	0 8
	Mr. J. M. Curseţji, District Deputy Collector.										
92	Khatáv (Vákeshvar).	Wheat, 13th January 1895.	16	800	33	381	...	11 10 6	1 9 4 R. S.	13·58	0 10
93	Do. (Pusesávli).	Gram, 19th January 1895.	11	270	47	241	256	6 12 11	1 11 0 R. S.	24·77	0 10

Central Division, 1894-95—concluded.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
	$56\frac{1}{3}$	$3\frac{6}{7}$	*Experiment No. 91.—Nágli* on light reddish soil manured with six carts per acre of cowdung and growing the same crop every year. Season favourable and tillage good. Seed rate very high. Outturn full maximum of the formulæ standard. By-product valued very high at Rs. 6 per acre.
111	$32\frac{7}{10}$	...	*Experiment No. 92.*—Unmanured and unirrigated wheat on medium black soil, growing wheat and gram with a sprinkling of safflower every year. Late rains were favourable and hence season was fair. Tillage fair. Outturn 11 annas of the formulæ standard. By-product not valued at all, though useful as fodder.
115	$38\frac{1}{3}$	$4\frac{4}{7}$	*Experiment No. 93.*— Gram on similar soil, growing without manure *jowári*, wheat, gram and *bájri* on different portions of the field and lately also garden crops with the assistance of a newly constructed *budki*. Season reported not to be favourable, and tillage very indifferent. Seed rate double the formulæ rate. Incidence high, owing apparently to poor crop.

Summary of Crop Experiment Reports,

O. S. =Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	BELGAUM.		Annas	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. C. C. Boyd, Assistant Collector.										
94	Gokák (Vaderhatti).	Spiked millet (Bájri), 29th November 1894.	15	600	2	454	555	12 8 11	0 2 1 R. S.	1·03	0 8
95	Do. . (do.)...	Great millet (Jowári), 29th November 1894.	18	1,260	3	664	810	19 14 5	0 2 1 R. S.	0·65	0 8
96	Do. (Mudalgi).	Do. (do.), 12th January 1895.	6	175	3½	126	590	8 3 6	1 4 9 R. S.	15·77	0 8
	Mr. L. C. Swifte, Assistant Collector.										
97	Paragad (Saundatti).	Wheat, 25th January 1895.	12	500	25	425	4 bundles.	12 9 7	1 12 8 R. S.	14·22	0 10
	Mr. N. G. Deshpánde, District Deputy Collector.										
98	Chikodi (Hukerí) ...	Great millet (Khab-shedgár Jowári), 10th December 1894.	20	1,400	7½	1,316	4,024	44 15 11	1 15 3 R. S.	4·34	0 10
99	Do. (do.) ...	Do. (Gidgidgemp Jowári), 10th December 1894.	20	1,400	13	1,486	3,092	47 9 6	1 15 3 R. S.	4·10	0 20
100	Do. (Jábápur)...	Do. (Gund Jowári), 9th December 1894.	20	1,400	4	556	796	19 1 10	0 13 1 R. S.	4·27	0 10
101	Do. (do.) ...	Do. (Shedgár), 9th December 1894.	20	1,400	8¾	819	1,072	26 12 9	0 13 1 R. S.	3·05	0 10
102	Do. (do.) ...	Do. (Gund Jowári), 9th December 1894.	20	1,400	25	244	588	9 1 7	0 8 3 R. S.	5·66	0 20
	BIJA'PUR.										
	Mr. H. Page, Assistant Collector.										
103	Bágevádi (Mulvád) .	Spiked millet (Bájri), 17th November 1894.	8	160	4	331	436	6 12 4	0 3 1 R. S.	2·84	0 10

Southern Division, 1894-95.

R. S.=Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
85	48⅛	1⅐	*Experiment No. 94.—Bájri* on hard red stony land, manured with 7 or 8 carts of cattle dung and sweepings every other year and growing *jowári* and *bájri* alternately. Season very fair. Rain for sowing came very late and that at end of season was deficient. Tillage not careful. Seed rate low. Crop 12 annas according to the formulæ.
81	47¾	1⅛	*Experiment No. 95.*—Kharif *jowári* on similar but more liberally manured land growing *jowári* and castor seed in alternate years. Season as above. Tillage careful. Crop 12 annas.
80⅝	41⅓	1	*Experiment No. 96.*—Rabi *jowári* on unmanured rich black soil growing kharif and rabi *jowári* in alternate years. Season bad, rain being scanty both at seed time and later on. Tillage indifferent. Crop poor.
82	40½	1⅓ bundles.	*Experiment No. 97.*—Dry-crop wheat with a sprinkling of safflower on hard black soil, lightly dressed with about 3 carts of cattle dung and ashes per acre, and growing (1) wheat, (2) cotton and (3) *jowári* in succession. Season somewhat unfavourable, the crop having suffered from want of moisture, and also it is said from west winds. Seed rate below average. Yield in column 7 exclusive of the subordinate crop which occupied about $\frac{1}{9}$ of the total area and which was not tested.
85	40½	2⅐	*Experiment No. 98*—Kharif *jowári, Khab-shedgár,* on black soil, manured with 6 carts of ordinary manure and by folding sheep. Cotton was grown in the previous year. Season favourable and tillage careful. *Tur* sown mixed with *jowári* in every sixth row. Subordinate crops not tested in this and the following 4 tests.
85¼	41	2	*Experiment No. 99.—Gidgidgemp,* another variety of *jowári,* grown on another part of the above field. 16 carts of ordinary manure applied to this portion which grew heavily manured chillies during the previous 2 seasons. Season, &c., as above. Here every 4th row was mixed with *tur.* Sample ser fell short of the recorded weight by 4 tolas.
84¾	40⅕	1⅛	*Experiment No. 100.—Gund jowári* with *kulthi* in every 4th row on a good reddish soil mixed with small stones and lightly dressed with 4 carts of manure. Other conditions as above. Crop 11 annas according to the formulæ standard.
85	40½	1¼	*Experiment No. 101.—Shedgár jowári* on another part of the above field which received no manure for the test crop, but was dressed liberally for chillies grown in the previous year. *Tur* and *jowári* were mixed before sowing. Season, &c., as above. Crop compared to the formulæ 13 annas.
83½	39⅘	1⅕	*Experiment No. 102.—Gund jowári* on reddish *mardi* land, growing without manure, (1) *rála* and *bájri,* (2) and (3) *jowári,* (4) *rála* and *bájri. Tur* and *kulthi* were the subordinate crops this year. Season, &c., as above. Seed rate very high. Crop poor being only 7 annas according to the formulæ.
149¼	53¾	6⅕	*Experiment No. 103.— Bájri* with every fifth row alternately of *kulthi* and *tur* on inferior black soil, *mardi,* manured for the first time with about 3 carts of farmyard manure and growing early and late *jowári* and also *bájri* each with subordinate mixtures. Season fair; tillage good. Outturn exclusive of the subordinate pulses which were not tested.

Summary of Crop Experiment Reports,

O. S. = Original Survey;

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					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	BIJA'PUR—*contd.*		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent	A. g.
	Mr. R. C. Artál, District Deputy Collector.										
104	Bijápur (Navarasapur).	Spiked millet (Bájri), 14th November 1894.	16	640	4½	426	996	9 7 3	0 2 0 R. S.	1·32	0 10
105	Do. (Bijápur) ...	Do. (do.), 15th November 1894.	16	640	4½	519	1,081	11 7 9	0 7 4 R. S.	3·99	0 10
106	Sindgi (Sindgi) ...	Great millet (Bile Jol Jowári), 18th February 1895.	14	800	3½	681	1,701	15 8 0	0 15 3 R. S.	6·14	0 10
	DHA'RWA'R.										
	Mr. R. Knight, Assistant Collector.										
107	Hubli (Anchatgeri).	Eleusine coracana (Rági), 5th December 1894.	12	500	5⅔	966	935	13 13 0	0 14 9 R. S.	6·68	0 8
	Mr. L. C. Swifte, Assistant Collector.										
108	Ránebennur (Chalgeri).	Do. (do.), 2nd December 1893.	10	250	4⅓	815	1,474	13 12 0	0 12 5 R. S.	5·64	0 10
	Mr. F. G. H. Anderson, Assistant Collector.										
109	Karajgi (Neglur) ...	Italian millet (Navani), 2nd December 1894.	11	270	6⅓	843	2,631	11 13 0	0 8 8 R. S.	4·58	1 0
	Mr. K. N. Bhángáonkar, District Deputy Collector.										
110	Gadag (Hesrur) ...	Eleusine coracana (Rági), 5th December 1894.	10	250	3	1,023	181 chaff.	19 4 11	0 12 10 R. S.	4·15	0 10
111	Navalgund (Morab)..	Gram, 6th February 1895.	8	140	21½	242	143 chaff.	7 10 7	1 9 5 R. S.	20·73	0 14

Southern Division, 1894-95—continued.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
148½	51¼	8	*Experiment No. 104.*—*Bájri* with a mixture of *math* in every sixth row on poor sandy loam soil growing without manure *bájri* and late *jowári* each with subordinate pulses. A large portion of the field lies waste for grass every year. Season somewhat late but good on the whole. Tillage fair. Outturn exclusive of the untested subordinate pulse and represents a 12-anna crop of the formulæ. Sample ser received in this office weighed 4 tolas short of the reported weight.
146½	50¾	8	*Experiment No. 105.*—Same crop with a mixture of *tur* and sprinkling of *ambádi* and *mug* on similar but somewhat superior soil growing late *jowári* and *bájri* in alternate years. Season, &c., as above. Subordinate crops not tested. Outturn compared to the formulæ 14 annas. Sample weighed 143 tolas only.
157¾	54½	5	*Experiment No. 106.*—Late *jowári, bile jol,* on fair black soil growing during the past 4 years, (1) cotton, (2) and (3) late *jowári* and (4) linseed and wheat. Field last manured four years ago with about 6 carts per acre. Season favourable. Tillage fair. Field weeded four times, yet was full of *hariáli.* Seed rate low. Crop about 13 annas according to the formulæ standard.
146	75	8⅔	*Experiment No. 107.*—*Rági* on red *masári* soil lightly manured three years ago with ordinary manure. Rotation undefined. That during last three years was (1) *rági, navani, sáva, kulthi* and *bájri.* (2) *jowári* and (3) *rági, kulthi, tur* and *sáva.* Season unfavourable owing to insufficient rainfall. Tillage fair. Crop above average of the locality and 19 annas compared to the formulæ. Sample received in this office gave an excess of 4 tolas.
135⅔	83½	3½	*Experiment No. 108.*—*Rági* with *jowári* in every fifth row on red *masári* soil manured with about 12 carts per acre of ordinary manure and growing usually *jowári, navani* and *rági* in succession. Season fair and tillage good. Outturn exclusive of the subordinate crop. No sample ser received in this office as required by standing orders. The experiment was carried out in the previous season, but received too late for inclusion in last year's report.
170	79⅔	19⅐	*Experiment No. 109.*—Italian millet, *navani,* on a reddish black sandy soil, *galwari,* growing without fixed rotation *jowári, navani,* and cotton. Field manured with about 9 carts of farm-yard manure and stable litter. Season somewhat unfavourable; rain ceased early and some of the plants dried off. Outturn, however, more than bumper of the formulæ though valued at 11 annas only. Sample ser received in this office gave a deficiency of 24 tolas. Hence figures doubtful.
142½	65¼	2⅐	*Experiment No. 110.*—*Rági* on white *masári* soil growing *jowári* and *rági* in alternate years. Part of the field manured every year with about 15 carts of cattle dung and sweepings per acre, the manuring of the whole being completed in 5 years. The tested portion manured in 1893. Season unfavourable, crop having suffered from long break in August and September. Tillage careful and outturn quite satisfactory. Sample ser weighed 145½ tolas in this office.
151½	38	1⅐ chaff.	*Experiment No. 111.*—Gram on rich black soil lightly dressed with ordinary manure and growing wheat, cotton, gram and *jowári* in no definite rotation. Season unfavourable, rain being insufficient and unseasonable. Safflower occupied every seventh row, but it was not tested and the outturn is exclusive of the oilseed. Crop 11 annas of the formulæ. Sample ser gave an excess of 4 tolas in this office.

Summary of Crop Experiment Reports,

O. S.=Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	KOLA'BA.		Annas.	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. C. G. H. Fawcett, Assistant Collector.										
112	Karjat (Mamdápur) .	Eleusine coracana (early Nágli), 31st October 1894.	16 to 18	800 to 900	22¾	1,384	...	26 12 4	0 4 3 R. S.	0·99	0 4
113	Do. (do.) ...	Panicum miliare (Halvi or early Vari), 31st October 1894.	16 to 18	800 to 900	26⅜	974	...	15 9 2	0 4 3 R. S.	1·70	0 4
114	Do. (Neral) ...	Niger-seed, 31st October 1894.	16 to 18	400 to 450	13½	204 seed.	...	9 6 0	0 5 4 R. S.	3·55	0 4
	Mr. H. O. W. G. Brooke, Assistant Collector.										
115	Karjat (Karjat) ...	Gram ...	12	250	70 to 80	827	...	27 13 0	4 14 5 R. S.	17·62	0 8
116	Do. (Tupgaon) ...	Large fruited dolichos, (Kadve Vál).	12	200	24	933	20 baskets.	20 12 0	6 6 5 R. S.	30·85	0 8
	Mr. R. E. Kánga, District Deputy Collector.										
117	Mángaon (Bhadáv) .	Gram, 9th March 1895.	12	200	80	267	...	9 4 7	0 15 3 O. S.	10·26	0 8
118	Do. (Bámnoli) ...	Do. 10th March 1895.	16	320	157	397	...	13 9 1	0 13 5 O. S.	6·18	0 8
119	Do. (Nilghun) ...	Do. ...	10	125	117	210	...	7 2 3	0 14 0 O. S.	12·25	0 8
	Mr. W. S. Cole, Assistant Settlement Officer, Konkan Revenue Survey.										
120	Mángaon (Utekhol) .	Rice (Panvel), 15th November 1894.	18	2,250	20 to 30	1,593 in husk.	2,260	32 3 0	3 2 2 O. S.	9·71	0 2

Southern Division, 1894-95—continued.

R. S.=Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
63	57⅔	...	*Experiment No. 112.*—*Nágli* on stony shallow *varkas* sloping soil, growing (1) *nágli* and (2) *vari* after two years' fallow. Seed at first sown in a rábed seed-bed, the proportionate area of which for an acre of field is reported at about 6 gunthas. Seed-rate high. Season good, but heavy rain at end of season lodged some of the crop. Tillage ordinary. Outturn very satisfactory.
61	62½	...	*Experiment No. 113.*—*Vari* on another part of the above field. Area of seed-bed for an acre of transplantation reported at $2\frac{2}{16}$ gunthas. Other conditions same as above. Sample ser weighed 3 tolas short in this office.
53	21¾	...	*Experiment No. 114.*—Niger-seed on similar, but less stony and more level, unmanured soil, growing (1) *nágli*, (2) niger-seed after two years' fallow. Season, &c., as above Seed-rate high. Crop 11 annas according to the formulæ.
72½	29¾	...	*Experiment No. 115.*—Unmanured gram as a second crop on *chikanvat* moisture holding soil near the bed of a river, growing in each of the last three years rice followed by gram. Crop suffered slightly from excessive rain at end of season. Tillage ordinary. Seed-rate high. Outturn more than 1½ times the yield recorded for a maximum crop in the formulæ. Incidence on second crop alone.
77	46½	26 baskets.	*Experiment No. 116.*—*Vál* on fairly deep good soil, growing without manure rice every year followed by a second crop of *vál* only in years of ample late rains. Season very favourable and tillage fair. Outturn more than double the maximum crop of the formulæ standard. Incidence on second crop only.
80	28⅔	...	*Experiment No. 117.*—Gram on *malkhandi rabi* land, growing without manure the same crop every year. Season favourable; tillage good. Seed-rate high. Crop 14 annas according to the formulæ. Sample sers received from this officer in connection with this and the two following tests gave an excess of about 4 tolas in each case.
81½	29¼	...	*Experiment No. 118.*—Same crop on similar soil manured by sheep folding, and growing gram and *vál* in alternate years. Season, &c., as above. Seed-rate very high. Yield full maximum.
82	29⅓	...	*Experiment No. 119.*—Same crop on similar soil without manure. Gram and *mug* grown alternately. Other conditions as above. Crop 12 annas.
56½	61⅞	3¼	*Experiment No. 120.*—Rice, *Panvel*, on dark brown soil, growing the same crop every year without manure and without any second crop. Seed sown in a rábed seed-bed, but its proportionate area to that of field not ascertained. Season favourable and tillage good. Area of test below the prescribed minimum in this and the following two tests. Samples of local measure sers not forwarded by the experimenter as required by standing orders.

Summary of Crop Experiment Reports,

O. S. — Original Survey ;

No.	District, Taluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
			Annas	Lbs	Lbs	Lbs.	Lbs.	Rs a. p.	Rs. a. p	Per cent.	A. g.
	KOLABA—*contd.*										
	Mr. W. S. Oole, Assistant Settlement Officer, Konkan Revenue Survey—continued.										
121	Mángnon (Khándád).	Rice (Ghosál), 16th November 1894.	18	2,250	20 to 30	2,100 in husk	5,420	49 9 4	3 12 9 O S.	7·67	0 2
122	Do. (do) ...	Do. (Hartál), 17th November 1894.	18	2,250	20 to 30	1,890 in husk.	3,880	38 10 4	4 1 1 O. S.	10·84	0 2
	Mr. W. D. Wilkins, Assistant Superintendent, Konkan Revenue Survey.										
123	Mahád (Chámbhárkhind).	Do. (Mudaga), 16th November 1894.	14	2 010	48	2 147 in husk.	2,256	47 13 10	7 13 6 O. S.	16·38	0 4
124	Do. (do) ..	Do. (do) ...	14	2,010	48	1,437 in husk.	1,500	32 4 8	7 13 6 O S.	24·29	0 4
	Mr. J. A. McIver, Assistant Superintendent, Konkan Revenue Survey.										
125	Roha (Chávre) ...	Do (Kinjal), 19th November 1894.	16	2,400	55	2 079 in husk.	3,056	44 3 7	3 10 5 O S	8·25	0 5
	RATNAGIRI.										
	Mr. V. R Kelkar, District Deputy Collector.										
126	Deogad (Darum) .	Do. (Sonphal or Sarvat) 15th October 1894	5	95	61½	254 in husk.	506	5 14 1	0 4 0 O S.	4 25	0 4
127	Do. (Ozram) ...	Panicum maliaceum (Barag), 19th October 1894	9	205	29¼	676	...	10 10 1	0 4 0 O. S.	2·35	0 8
128	Do (Kankavli) ...	Niger-seed, 2nd November 1894	6	65	6⅓	169 seed.	...	5 7 10	0 8 0 O. S.	9·10	0 8

Southern Division, 1894-95—cotinued.

R. S. = Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee. Principal Product.	By-Product.	Remarks
13	14	15	16
Tolas.	Lbs.	Cwts.	
52½	57	3⅝	*Experiment No. 121.*—Rice, *ghosál*, on reddish brown, *rákat* soil. Other conditions as above.
58½	64	3⅝	*Experiment No. 122.*—Rice, *hartál*, on a little better soil than in Experiment No. 120. Other remarks as above.
60¼	53	2⅜	*Experiment No. 123.*—Rice, *mudaga*, on reddish brown sandy soil growing without manure the same crop every year. Seed-bed rábed as usual with cowdung, grass, &c., but its quantity not noted. Season somewhat unfavourable; but tillage good. The test area selected from the seed-bed which occupied one-sixth of the area of field.
60¼	53	2⅜	*Experiment No. 124.*—Same crop on another part of the same field which had not the advantage of the ráb. Other conditions as above. Crop 12 annas according to the formulæ standard.
58½	55½	4⅛	*Experiment No. 125.*—Rice, *kinjal*, grown annually without manure on fair alluvial soil which is however subject occasionally to being submerged with salt water at spring tides. Seed sown in a rábed seed-bed, 4½ gunthas of which gave seedlings sufficient for an acre of field. Some of the seedlings destroyed by heavy rain soon after plantation and a quantity of ungerminated seed had to be put in. Late rains were excessive and necessitated late reaping. Tillage good and outturn 15 annas of the formulæ.
33	45⅔	...	*Experiment No. 126.*—*Sarvat* or *sonphal* (red) rice on upland *varkas bhardi* land with soil only 3 or 4 inches deep, growing without manure (1) *barag* (2) niger-seed and (3) rice or *harik*, after 8 years' fallow. Season favourable. Low outturn attributable to the test crop being the last in the rotation and to careless cultivation. Crop 10 annas according to the formulæ.
38¾	63⅔	...	*Experiment No. 127.*—Black/ *Barag*, 3rd crop in rotation on *bhardi varkas* land, growing (1) *kalthi*, (2) *harik*, (3) *barag*, (4) niger-seed and (5) *sáva*; then land at rest for 7 years. Season as above. Outturn represents a 17-anna crop of the formulæ.
50⅛	30⅛	...	*Experiment No. 128.*—Niger-seed on somewhat superior *varkas* land, growing unmanured (1) *barag*, (2) *harik* and (3) niger, followed by 4 years' fallow. Season favourable, but outturn less than 11 annas, due apparently to the test crop being the last in rotation. Field weedy.

O. S. = Original Survey;

No.	District, Táluka, Village and Experimenter.	Crop and Date of Experiment.	Local Estimate in Annas.	Yield according to Formulæ.	Average per Acre.						Area of Test.
					Seed.	Yield of		Total Value of Produce.	Assessment, excluding Local Funds.	Incidence of Assessment on the Value of Gross Produce.	
						Principal Product.	By-Product.				
1	2	3	4	5	6	7	8	9	10	11	12
	RATNA'GIRI—*continued.*		Annas	Lbs.	Lbs.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	Per cent.	A. g.
	Mr. V. R. Kelkar, District Deputy Collector—continued.										
129	Deogad (Sávdao) ...	Eleusine coracana (Nági), 4th November 1894.	12	800	4¾	1,217	...	26 4 2	0 4 0 O. S.	0·95	0 8
130	Do. (Sángve) ...	Paspalum scrobiculatum (Harik), 11th November 1894.	8	160	15	714	...	6 12 11	0 4 5 O. S.	4·05	0 8
131	Do. (Bhiravde)...	Eleusine coracana (Nági). 11th November 1894.	12	800	5¼	1,129	...	26 1 10	0 2 0 O. S.	0·47	0 8
	KA'NARA.										
	Mr. N. B. Divátia, Assistant Collector.										
132	Ankola (Kattinhokla).	Rice (Wommadlu), 8th December 1894.	12	1,500	48	1,489 in husk.	6,482	26 11 2	2 8 0 O. S.	9·36	0 4
	Mr. J. McNeill, Assistant Collector.										
133	Honávar (Hulegár) .	Do. (Chitka), 26th March 1895.	16	...	308	960 in husk.	2,730 straw.	18 0 5	5 5 11 O. S.	30·07	0 4
134	Do. (do.)...	Do. (do.), 27th March 1895.	14	...	195	520 in husk.	2,040 straw.	9 15 4	5 0 0 O. S.	50·21	0 4

Southern Division, 1894-95—concluded.

R. S.= Revision Survey.

Equivalent in Tolas of local measure Ser.	Prices of Produce per Rupee.		Remarks.
	Principal Product.	By-Product.	
13	14	15	16
Tolas.	Lbs.	Cwts.	
56½	47	...	*Experiment No. 129.—Rági*, second crop in rotation, on slightly sloping *varkas* land, growing (1) *kulthi*, (2) *nágli*, (3) *harik* and (4) niger after six years' rest. Seed sown in a rábed seed-bed and seedlings after transplantation, top-dressed with fish manure. Season favourable. Tillage careful. Outturn full average according to formulæ.
51⅛	113	...	*Experiment No. 130.—Harik*, third crop, on gravelly *varkas* land, growing (1) *kulthi*, (2) *rági*, (3) *harik* and (4) niger-seed after rest for eight years. Field had been manured in the previous year for *rági*. Season, &c., as above. Crop 18 annas.
60¼	43¼	...	*Experiment No. 131.—Rági* on steep stony *varkas* land, growing this crop followed by *barag* and then land lying waste for 20 years. Seed as usual was sown on a rábed seed-bed and seedlings transplanted on land very lightly dressed with ashes and cowdung. Rainfall favourable and tillage good.
42½	62⅕	19⅐	*Experiment No. 132.*—Inferior rice, *wommadlu*, on light brown soil manured with compost of cowdung, ashes, leaves and litter about 3 tons per acre, and growing the same crop during each of the past four years. Crop irrigated from an adjoining *nála*, water in which this year was deficient and could be used for ¾ field only. Seed sown in a seed-bed, 2⅗ gunthas of which furnished seedlings for an acre of field. Season fair. Rain being deficient in the latter part of the monsoon, outturn moderate.
26½	58¼	13⅝ straw.	*Experiment No. 133.—Vaingan* or hot weather rice, *chitka*, on friable light soil manured with about 370 head-loads of cowdung and forest litter and growing early as well as late rice. The latter occupies part of the field only, the rest being sown with other crops or left unsown. Crop irrigated from a forest stream which dries up in the beginning of March. Season average; tillage careful. Seed-rate very high. Outturn much below average. Incidence on the second crop alone.
25½	58⅔	14⅐ straw.	*Experiment No. 134.*—Same crop on similar soil manured with about 470 head-loads of the above manure per acre. Other conditions same as above. Outturn very poor and incidence high even for a second crop.